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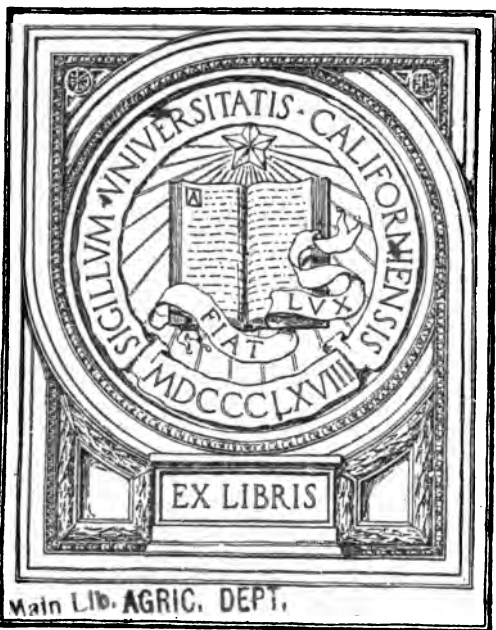
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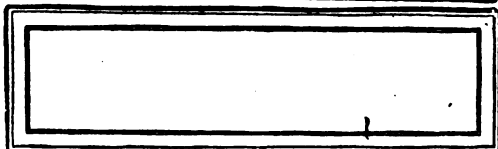
THE BOOK OF
THE APPLE

BY

H. H. THOMAS



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HANDBOOKS OF PRACTICAL GARDENING—VI
EDITED BY HARRY ROBERTS

THE BOOK OF THE APPLE



STUDY OF APPLE BLOSSOM

THE BOOK OF THE APPLE

BY

H. H. THOMAS

ASSISTANT-EDITOR OF "THE GARDEN," FORMERLY OF THE ROYAL
GARDENS, WINDSOR

TOGETHER WITH CHAPTERS ON
THE HISTORY AND COOKERY OF
THE APPLE, AND ON THE PRE-
PARATION OF CIDER: BY THE
EDITOR

JOHN LANE: THE BODLEY HEAD
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EDITOR'S NOTE

MR H. H. THOMAS, who is responsible for all that part of the present volume which relates to the cultivation of the apple, is a distinguished representative of the new race of gardening experts who combine scientific knowledge with practical—including manual—experience of their craft. Few names are more honoured among British gardeners than that of the late head of the Royal Gardens at Windsor; and, in having Mr Owen Thomas for his father, the author of this book received about the best possible gift which the goddess of garden-craft could bestow. Mr Owen Thomas has actively co-operated in the preparation of the present volume.

Mr H. H. Thomas has himself had exceptional experience in practical garden work. For a time he worked in the celebrated nurseries of Messrs Veitch, at Chelsea, and for two years was engaged in the gardens of Baron Alphonse de Rothschild, at Ferrières-en-Brie, Seine-et-Marne, which include one of the finest hardy-fruit gardens in France. Two years he spent at Kew, and five years in the Royal Gardens at Windsor—working mostly in the fruit department, of which he had charge when recently he left to take the post of assistant editor of *The Garden*.

The Editor wishes to express his thanks to several gentlemen who have in many ways lent him kindly help.

His friend and neighbour, Mr John Vivian of Meadowside, Hayle, is the owner and creator of the very beautiful garden and orchard in which were taken most of the photographs in this book.

Mr Radcliffe Cooke of Hellens, who, as member of Parliament, as writer, and as maker of excellent cider, has done as much as any living Englishman to popularise what one can but hope will again be our really national beverage, has given great help in the form of references to cider-literature, ancient and recent. Those great ciderists, Messrs Bulmer of Hereford have also given the Editor valuable assistance of a similar kind.

Messrs Barnett & Foster, of Eagle Wharf Road, London; Messrs Workman & Sons, of Slimbridge, Stonehouse; and Messrs Lumley & Co., of America Square, Minories, London, are all makers of first-quality machinery for the manufacture of cider, and to them the Editor is indebted for permission to illustrate certain of their special appliances.

To the proprietors of *The Morning Leader* and *The Gardeners' Magazine* the Editor is indebted for permission to reprint one or two essays from his pen which have appeared in their respective journals.

THE CULTURE OF THE APPLE

INTRODUCTORY

WITHIN the past few years the importance of fruit as an article of food has been widely recognised, with the result that many more acres of land are now devoted to fruit culture than was formerly the case. It is safe to assert that no other fruit tree has been planted in such increased quantities as has the apple; and this is not to be wondered at, for the apple is the fruit of Great Britain, *par excellence*. It has been proved conclusively that better apples can be grown in Britain, and that they can be placed on the market in better condition, more particularly as regards their flavour, than can those from abroad, although it is to be feared that to some extent from lack of knowledge, and also perhaps of method, good quality British grown apples are not so conspicuous upon the market as might be the case. The fact cannot be gainsaid that the climate of Britain is exceptionally well suited to the culture of the apple; there are certain districts better suited to its successful growth than others, but this is very often owing almost as much to the nature of the soil as to other influences. There are but few places in Britain where the apple will not thrive satisfactorily, and in the face of such a statement the importance of apple culture in this country cannot be over-estimated. So far as regards the perfect colouring of some of the more highly coloured varieties, there is apparently but little doubt that the Kent growers are able to hold the field; although, at some of the most recent exhibitions of fruit, the produce staged by growers in Wales, the Western Counties of

THE BOOK OF THE APPLE

England, Bedfordshire and Hertfordshire, has left very little to be desired in this respect. Those who have been privileged to see the exhibitions of fruit at Edinburgh and Belfast will have had undoubted proof of the capability of Scotland and Ireland to produce apples of the very best quality also. These instances are mentioned just to show that it is not merely in a few of the more favoured English counties that profitable apple culture is possible, but that from all parts of Britain first class apples are exhibited. Small growers should therefore take heart from the examples placed before them by those who cultivate fruit trees by the thousand, and endeavour to profit by them, for a great deal may be learned from these remarkable and representative displays annually made by our leading nurserymen and others. One may learn that the apple is, generally speaking, practically indifferent to locality, with a few notable exceptions; and we may also learn which particular varieties are best worthy of culture, their flavour, keeping properties, and other important points.

The apple, in its wild state, is found over a considerable portion of Europe, Britain included, and is commonly called the Crab (*Pyrus Malus*). It is generally believed that the forerunners of the now remarkably numerous varieties of apples in cultivation were not directly obtained from the Crab in Britain, but that they have been from time to time introduced from the Continent, for history informs us that apples were brought over to England by the Romans, and that in the days of Pliny they possessed two and twenty varieties. The Crab usually lives to a considerable age, much longer as a rule than does the cultivated apple; the longevity of the latter, however, greatly depends upon situation, soil, treatment, the variety, etc., these factors influencing in one way or another the life of the tree to an important degree.



AN ORCHARD-GARDEN

FORMS OF TREES

The intending planter of apple trees must first make up his mind as to the kind of tree he intends to purchase, and this of course will greatly depend upon the land or garden at disposal. If the latter is a small one, it would of course be folly to invest in large growing Standards, for, besides creating a great deal of unnecessary shade, such a practice would very severely limit the choice of varieties, as but few such trees could be accommodated in a small garden.

The principal forms of apple trees are the following: Standard, Half-Standard, Bush, Pyramid, Espalier, and Cordon.

A few remarks upon each may perhaps serve to explain its chief features and the positions for which it is best suited. We will first take the Standard. This is a form that must be known to everyone who is at all familiar with a country orchard. As a rule the Standard has a clear stem of six feet from the ground, that is to say, up to this point no branches or twigs are allowed to develop from the stem, which is perfectly free. Then, at a height of about six feet, the branches of the tree are allowed to develop, and are gradually so trained as to form a large more or less cup-shaped head, each branch, however, being properly regulated so that there may be no overcrowding of shoots and leaves. The shape of the Standard apple tree varies considerably, for different varieties are dissimilar in growth; some growing almost erect, while others again have a much more spreading habit. In time, however, a Standard invariably forms a large and spreading tree, the height of which varies according to the sort. The Standard is invaluable, indeed indispensable to the planting of an orchard on grass land. It is much more at home in the orchard than in the garden proper, unless the latter be

a good sized one containing sufficient room for all the various forms.

The reason of the Standard being so valuable for orchard-planting lies chiefly in the fact that it is grafted upon the Crab stock, and its roots, therefore, are much better able to find nourishment in the rough and practically untilled grass land, than would be those forms that are grafted upon the Paradise. The roots of the Crab are strong, and go far and deep in search of food and moisture, and are thus better suited to rough ground than the more tender and fibrous ones of the Paradise. So long as orchards on grass land continue to be planted, so long will the Standard apple grafted upon the Crab stock be in demand. The necessity, or at any rate the propriety, of having a clear stem of several feet is obvious. In grass orchards either a crop of hay is gathered from the field, or perhaps cattle are turned out to graze in it; with dwarf trees such would, of course, be out of the question. In many market nurseries the ground underneath the Standard trees of apples and pears is devoted to the culture of small fruits, such as gooseberries, currants, etc., and of various spring flowers that thrive well, and are cut before the trees become thickly covered with leaves. The drawback to the Standard apple tree is that it does not come into good bearing until some years after planting; indeed, it does not attain its full-bearing capacity until from twenty to thirty years old. When about six or seven years old, however, fair crops may be expected if the trees have been properly treated; but, as before mentioned, the land need not be left idle during the time that the fruit trees are developing. If the field was previously used for grazing or the grass mown for hay, it is altogether as good for the purpose still, or, if it is desired, the grass may be turned over, and the ground prepared for the culture of bush fruits, strawberries, or

flowers. Viewed in such a light, the orchard of Standard apple trees is not at all a bad investment, for but little labour is required when once they are planted and established. When the trees come into full bearing, they require surprisingly little attention beyond pruning and keeping clean.

To summarise what has been said of the Standard apple tree: For planting on grass land, it is most valuable because of the strong and deep roots sent out by the Crab stock upon which it is grafted, and because also of the high clear stem, which permits of other fruit trees and flowers being grown beneath, and allows other work also to be done. On the other hand, at least six or seven years must elapse after planting before even a fair crop can be expected.

The Bush apple tree is the most widely planted, and in some respects the most valuable form of the tree that we have. For the small garden it is invaluable; since it takes up but a small amount of space, usually bears remarkably good crops of fruit, and comes into bearing quite early. When only two years old, these small Bush apple trees will carry several splendid fruits. It is surprising to see what may, however, be seen in any of our large fruit-growing nurseries in the early autumn, quite young Bush apple trees bearing six, eight or twelve fruits that would grace any exhibition board; it is, indeed, from these young trees that most of the exhibition fruit is secured. The shape of the Bush may be, perhaps, best described as somewhat resembling that of a cup. It has no central stem, but at about nine inches or so from the ground the branches are trained almost horizontally, for a short distance, when they are allowed to grow perpendicularly. Other branches, of course, eventually form in the centre of the Bush, but plenty of room is always allowed between them. The Bush apple tree is one that is calculated to give the

most fruit from a small portion of ground, for the width of the tree, for a considerable number of years at least, will not exceed six feet, though a good height may be reached within the same time.

The Bush is grafted on the Paradise stock, whose roots are fibrous and spreading, but not very far-reaching, and remaining comparatively near to the surface of the ground. Garden land that is cultivated, say to the depth of three feet or so, is well suited to fruit trees grafted upon the Paradise. Providing the roots have such a depth of good soil they should be well able to support the tree above, especially as they can be so materially assisted from the surface by mulching and manuring. The roots of the Crab that are so deep and far-reaching cannot be benefited to the same extent by the surface application of manures as can those of the Paradise, which are much nearer and more easily reached. The fact of the roots of the Paradise being so near the surface makes this an especially valuable stock upon wet or badly-drained soils; the roots do not penetrate into the bad and unwholesome subsoil as those of a deeper rooting character would do. Therefore, by planting Bush apple trees on the Paradise stock a satisfactory crop of fruit may be had upon land that, planted with Standards on the Crab stock, would be quite worthless, for the roots penetrating the stagnant subsoil could not fail to produce unhealthy and diseased trees. Bush trees can be planted closely together, much more so than can Standards, since a considerable amount of room must be allowed for the development of the spreading head of the latter, while, as before mentioned, the Bush form grows almost upright.

The Pyramid is a form of tree more usually made use of in the training of the pear than of the apple, although the latter is also to a considerable extent trained in this

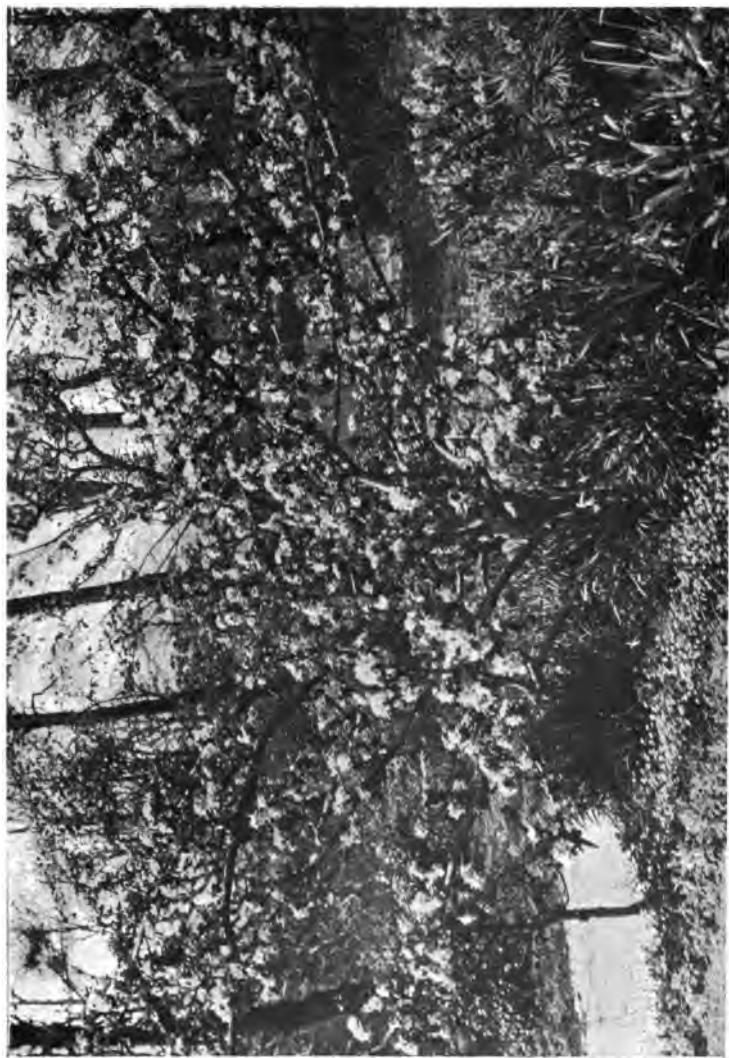
manner. The Pyramid differs from the Bush form in having a central stem, and from this the branches emanate in a horizontal, slightly drooping direction. It eventually makes a larger tree than does the Bush form, but it also takes up considerably more room owing to its method of training. Whereas the branches of the Bush, after having been trained horizontally for a short distance, then grow in practically an upright direction, those of the Pyramid continue to extend nearly horizontally, thus, of course, taking up more ground room every year. The Pyramid apple tree may either be had grafted upon the Crab or upon the Paradise stock.

Espaliers are valuable, and may be obtained in a variety of shapes. An Espalier apple tree is usually understood to signify one that is trained against an espalier or fence, the latter being invariably of wire. Such trees are valuable because they take up but a small space in the garden, and usually bear abundant crops of good fruit. They are to some extent more sheltered than are trees in the open, for the trellis against which they are growing breaks the force of the wind, often a cause of considerable damage to the unprotected fruit crop. A single trellis, made by erecting strong iron or wooden poles at a distance of six feet apart, and connecting them with wires placed about one foot apart, takes up practically no room, yet a great deal of fruit can be obtained from trees planted against such a structure. Either horizontally-trained trees or cordons may be planted against this trellis. A most useful method of espalier training has lately become more popular, and deservedly so, namely, that by which the trees known as dwarf horizontal espaliers are produced. These are not more than about fifteen or eighteen inches from the ground, and each consists simply of a stem of that height and two branches trained horizontally in opposite directions. For planting close to

the side of walks in the kitchen and fruit garden they are most useful; the two branches may be extended any distance along the wire, to which they must be tied. This wire is easily fixed up by driving short iron stakes into the ground, each having a hole in the top, through which to pass the wire. For a simple, inexpensive and profitable manner of cultivating the apple this is to be recommended. Apples on walls are not extensively grown in Britain, simply because, generally speaking, such a method is superfluous. We have for some years grown cordons against a wall, but it is doubtful if better fruit has been thus obtained than from the open. Cordons and horizontally trained trees are the most suitable forms for planting against walls.

PLANTING

Before describing the details for the carrying out of this, one of the most important operations connected with the cultivation of all fruit trees, a word or two must first be written with respect to the purchase and treatment of trees previous to planting. Always make a point of dealing with a firm whose cultural skill and supply of good plants are known to be reliable, otherwise disappointment will be sure to result, and several years of patient labour and care will have been completely thrown away. It is most important that good quality trees, true to name, should be obtained, for then the planter can devote his energies to the culture of his plants with the certainty of having made a good beginning, so far as these items are concerned. Nothing is more annoying than to find when a tree comes into bearing that it is not the variety one was under the impression of having planted, but one perhaps that is practically worthless. Dealing with reliable, well-known firms will, however, ensure the de-



A HAWTHORNDEN IN BLOSSOM

livery of correctly-named, well-grown plants. Another point that the intending planter should bear in mind is the fact that one often finds good local varieties that grow remarkably well in his neighbourhood. When such happens to be the case it is just as well to procure a few trees if the variety is a really good one (and one needs to be careful in this particular, since very many local varieties are quite worthless), for one can be practically sure of their thriving well with ordinary care and attention. It is worth remembering also that to place one's orders in good time will probably mean that they will be executed early, and therefore most likely will secure better trees than would be the case if the order were given when the planting season had well begun; for the best plants will certainly not be kept until the last. Supposing the ground not to be ready to receive the trees when they arrive, unless proper precautions are taken, irretrievable harm may quickly be done. The roots, of course, will be practically devoid of soil, though probably well covered with mats. The best thing to do as soon as the trees arrive is to take out a shallow trench in a border, remove the mats from around the roots, and lay in obliquely the roots and a small portion of the stem of each tree. Place them so that the trees lean away from the front of the trench, then well cover over the roots with the soil previously removed from the trench, making sure that none are left exposed. If such a practice is followed, the trees are perfectly safe until required for permanent planting, quite as safe, in fact, as though they were properly planted. It does not occupy much time to do this work, yet much disappointment may be avoided by so doing. It may easily happen if the plants are allowed to lie about while the planting is in progress, that their roots become dried and withered, and the plants cannot then fail to suffer. Even if it be only for a short time,

it is preferable to cover over the roots with soil, and so make sure that they can take no harm.

We will first consider the planting of the standard apple tree on grass land. A suitable distance at which to place the trees is twelve feet apart in the rows, and the rows twenty-four feet wide. Eventually, every other tree in the rows may be thinned out, thus leaving the trees at the same distance apart throughout. Of course they will not be too thick for many years after planting, but, if all goes well, they will in the future require more room; and, as provision can easily be made for this at the commencement, it is by far the better plan to do so. The intending planter must, therefore, place rows of pegs eight yards wide, each peg being four yards from the other in the rows. Having done this, remove the turf over a piece of ground six feet square, choosing the peg as a centre. Then procure a piece of string two and a half feet long, attach one end to the peg in the centre of the cleared space, and tie a small pointed stick to the other end. Then, with the string stretched quite tightly, make a circular mark in the ground with the pointed stick—this mark being at a uniform distance of two and a half feet from the centre, and forming the circumference of the hole in which the standard apple tree will be planted. Commence to remove the soil from within the circular mark, and continue to do so until the hole is two feet deep. Then with the spade dig over the bottom thoroughly, so that the soil is stirred and turned over to the depth of one foot or more. The hole will now be ready to receive the plant, and the proper depth at which to place the latter must be determined. This is one of the important points in planting, for the roots, if planted too deeply, will be deprived of the necessary air and warmth which they would receive if nearer the surface, and they

will also be in danger of descending into the subsoil, than which nothing is more detrimental to the successful bearing of an apple tree.

If, on the other hand, the tree is placed too high, it will not be firm, will be very liable to be blown about by the wind, and never will obtain a firm root-hold.

The best guide to the proper planting of an apple tree is to place it the same depth as it was before, and this can easily be found out by examination of the stem, for upon the latter will be seen the soil-mark, showing exactly how much of it was covered before. It is, however, always well to be able to make certain that the depth at which the tree was previously planted is correct; and for this to be so, the uppermost roots, when finally covered, should be within three or four inches of the surface of the ground. If these two rules are adhered to, the beginner in planting cannot go far wrong.

With the hole two feet deep above the bottom soil that has been well turned over, it will most probably be too deep for the apple tree if this is to be brought to its proper height. First make the basal soil firm by treading, and then fill the hole with a mixture of the old soil and a little new until it is high enough to receive the plant; this soil also being made firm. Take care that the centre of the hole is slightly higher than are the sides, so that, when water is afterwards given, it may not make its way right under the plant, which it would be likely to do were the centre lower than the sides, but will rather find its way in between the roots spread out all around.

Having made sure that the soil is of the proper height and has been made firm, place the plant upon it, and quite in the centre of the hole. Then spread out the lowest roots of the plant evenly and carefully upon the

soil, drawing them out as straight as can be and in the direction of the sides of the hole. Cut off with a sharp knife any that are bruised or broken, taking care to make the cut in an upward direction and not downwards. If the latter is done, rootlets, which will eventually proceed from the cut end, will be almost sure to grow in a downward direction, whereas if the cut is made as advised, it is practically as certain that they will grow upwards. Throw a spadeful of new soil upon the bases of the roots—that is to say, near to the stem—and draw this with the hands loosely towards their extremities. This has the effect of working the soil well in amongst the tiny roots, and no interstices are then left. It will probably be necessary to cover over three layers of roots separately, for the roots must not be disarranged more than is unavoidable. When the bottom layer is completely covered and the soil has been made firm, spread out the roots immediately above, and treat them likewise, and continue to do this until all the roots have been spread in as nearly a horizontal direction as possible (except that they must fall a little at their ends), and all covered over with soil. It may of course be necessary to make more than three layers of roots if the trees are very well rooted, but, generally speaking, they can be properly planted by covering them over thus. Badly rooted trees may not give even so much trouble, two layers probably sufficing. It is important to have fresh soil placed immediately in contact with the roots, for this is very helpful to them in becoming established in their new quarters. When all the roots are covered, the soil previously taken from the hole can again be used, and some of it also before, providing a fair proportion of fresh is mixed with it. Take care that the soil is made quite firm as the work proceeds, as otherwise the tree will afterwards be liable to sink considerably, in which

case the planter will find that it is much deeper than it really ought to be. Even with firm planting, the tree will sink to a certain extent, but not enough to affect its welfare. When finished off, the soil around the tree will be somewhat higher than the surrounding turf, but this will in time resume its normal level, so that no notice need be taken of it. As advised when preparing the base of the hole, leave the centre of the surface soil (near to the stem of the tree) rather higher than it is towards the sides for the same reason as before, namely, that the water may not collect around the base of the tree when rain falls or water is applied. If held in a hollow in the centre it is almost sure to soak down by the stem and leave all the important roots dry, thus producing a state of affairs most detrimental to the successful establishment of the tree. *Do not replace the turf upon the soil within three feet of the tree stem.* This is one of the most important of the items in the culture of standard apple trees, and every good grower now puts it into practice. With the grass growing right up to the stem of the tree, the surface soil there must be in an almost continual state of dryness, by reason of the innumerable grass roots and the drain upon it by these. It is also impossible, or at any rate futile, to apply a mulch, and almost as bad to give manure water, for the grass, and not the apple tree, has the benefit of whichever is given. Many of the most valuable roots, viz. the small fibrous ones, "the feeders," are destroyed by allowing the grass to grow right to the stem, simply for the reason that they can obtain no food or moisture. I well remember an orchard on grass land planted with standard apple trees on the crab stock, all around which the grass was permitted to grow, with the result that the trees became stunted, and for a time progressed very unsatisfactorily. Eventually the turf, for about two and a half feet from

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the stems, was removed, and a remarkable difference in the growth of the trees has since been apparent. The impossibility of mulching is perhaps one of the greatest evils associated with this altogether wrong practice, for the value of a good mulch of manure during a hot summer can hardly be overestimated. It tends to keep the soil cool and moist, for evaporation is prevented, besides which the roots have continually the benefit of a mild stimulant.

The maintenance of the delicate fibrous roots in a cool and moist rooting medium throughout the long, hot days of summer, makes just *the* difference between a well grown tree and a badly grown one. Also, when the ground is well mulched, one can give water with the knowledge that it will not all have been dried up by the sun in a day or two, but that it will really benefit the trees to which it is given. Do not then, upon any consideration, allow the grass to grow within two or three feet of the stems of standard apple trees.

Except that there will be no turf to remove, and that the hole need not be made quite so large, the planting of bushes, espaliers, etc., in the garden proper may be performed in exactly the same manner as that advised in detail for the standard. The same care in spreading out the roots, in placing fresh soil immediately around them, and in making this firm, is necessary if success is to be ensured. The proper staking of apple trees, after they are planted, is a matter that must not be neglected, and the standard will need more attention with regard to this than will the dwarf bushes and espaliers. If straight, well-developed stems are to be secured, it is quite essential to support them for a year or two at any rate, for the long, thin stems are easily blown about by the wind, and if not well staked they will certainly either become crooked or even be more seriously damaged. Stout, healthy bush

apple trees do not require staking if they are firmly planted.

Secure strong stakes from five feet to six feet high for the standards, and drive them nine inches or so into the ground—in fact, until they are quite firm—and at a distance away from the stem of quite six inches, in order to avoid damaging the roots; for by cutting through these near to the stem a great deal more harm would be done than if the stake were driven in some distance away, where the roots are smaller and farther apart. The breaking of the base of a root might, of course, mean the sacrificing of many rootlets, for as the root goes away from the stem, it naturally branches and subdivides. Having driven in the stake securely a few inches away from the tree-stem, fasten a band of indiarubber or leather around the latter and near to the top of it, tying it round with tarred string; then fasten another piece of tarred string around the band, and by means of this fasten it to the wooden stake. Unless the band is first attached to the tree, it will be liable in windy weather to chafe the bark by moving up and down, as well as to loosen the stake.

The best time of the year for planting apple trees is undoubtedly the autumn, in the month of November preferably; the trees then still have some leaves remaining upon them, and the soil has not altogether lost its warmth. A certain amount of root action is therefore set up before the commencement of winter, the trees become partially established, and will be all the better able to make a good start in the spring. There is everything to be said in favour of early planting, and whenever possible this should be practised. If, however, the trees cannot be planted in November or very shortly afterwards, it is advisable to postpone the work until early spring, for if

they are removed from the quarter where they have been grown when quite leafless, and transferred to ground that by the end of December or so must be to a great extent cold, and probably wet, it is quite impossible for them to make roots during the winter months. This being the case, it is more than likely that some of the roots will decay by reason of their unsuitable surroundings, and the tree will really be in a worse plight in the spring than when planted, and consequently be unable to make a satisfactory start into growth. We see then the evil of planting in mid-winter — a late start the following year, which may mean the comparative failure of the tree ever to make a really good specimen. The fact of growth commencing late will probably result in the wood never becoming properly developed and ripened as it should be, and this, of course, will be detrimental to the growth of the tree the next year, for the buds also will be immature, and not capable of producing strong healthy shoots.

If, therefore, planting cannot be done in the month of November or December, it is far better postponed until the spring, say, early in March, for then the ground is warmer, and the tree will at least be able to make a good start. Spring planting, however, is not to be preferred to autumn planting; it must just be regarded as better than midwinter planting. Spring-planted trees have not had the advantage of being able to establish themselves in their quarters before winter, and do not therefore start the growing season under such favourable circumstances. On light soils autumn planting is particularly to be desired, for upon such land it is often difficult to get trees to start well if planting is deferred until the spring. Much attention is necessary in order to ensure the land being kept well supplied with moisture, especially if the spring



KESWICK CODLINS

is at all dry. Unless this is carefully attended to, it is almost a hopeless task to attempt to establish spring-planted trees upon a hungry soil. A good mulch of short farmyard manure is of incalculable benefit in such a case. Upon heavy land there is not the same tendency for the spring-planted apple tree to suffer from want of water, and, if the autumn were unusually wet, it would be just as well planted in the spring on soil of a retentive nature. Generally speaking, however, autumn planting is much to be preferred, and upon comparatively dry and hungry soils may be said to be almost absolutely essential to success.

PRUNING

The pruning of the apple tree, no less than the planting of it, is a most important cultural detail, and unless a certain amount of skill and knowledge is brought to bear on its performance, more harm than good may result. The operator must first have a true conception of the purpose of pruning, and this, put into few words, is properly to regulate the balance between fruit and foliage, so that neither the one nor the other preponderate, to train the tree in such a manner that each shoot is allowed sufficient room to develop, and the outline of the particular form of tree in question is ensured. All who have to do with symmetrically trained trees in gardens, or with the more free-growing standards in grass orchards, will know that each one must be trained so as to preserve its true design, not so much for the sake of appearance, as to be able to make the most of the space available. It is very evident that if one has a row of apple trees, and the branches are allowed to grow in all directions, not only will much valuable space be wasted in certain quarters, but the branches will be much crowded in others. The first

essential point to be observed in pruning, therefore, is so to regulate the branches that they are in no way crowded, but are sufficiently far apart to allow of the free admittance of sun and air, two most important factors in successful fruit culture. It is not possible definitely to state the distance apart that each of the main branches should be, because with different varieties the habit of growth varies considerably; what would be ample room for one kind might mean that a stronger-growing sort would be unduly crowded. Each variety must be treated according to its individuality, and for any special characters attaching to certain varieties the reader is referred to the chapter dealing with the best sorts of apples. Generally speaking, however, the main branches of an apple tree need to be quite fifteen inches apart. During the first few years of the life of the tree, but little pruning is necessary. The object of the cultivator should be to encourage the young tree to grow well, so as to form for itself a good foundation, allowing all shoots to grow unchecked during the summer time, and just slightly shortening the principal ones at the winter pruning. It is a good plan to remove all blossom buds that show for the first two years or more, if the tree is not growing satisfactorily.

Pruning is now by almost all practical fruit-growers divided into two phases, namely, summer and winter pruning. The older school of gardeners were in the habit of allowing all growths made during summer to go unchecked and undisturbed until the winter pruning, generally performed in January. That such, however, was a mistake is now generally recognised; the result of allowing these shoots to develop freely and vigorously throughout the growing season and then cutting them hard back in the winter, being to produce a mass of growth in the following season; the three or four buds to which the summer shoot was cut down, all becoming wood buds,

instead of forming fruit buds, as some of them, at least, should do. The reader has only to try an experiment to be convinced of the value of summer pruning. Let him, for instance, choose two healthy shoots upon different branches of the same tree, one to be left unchecked until winter, the other to be pruned in summer, and then note the nature of the buds formed upon the basal portion of the shoots the following year. The great value of pruning lies not so much in the *removal* of wood, but rather in its *regulation*. The better regulated it is, the less will be the need of removing growth, and with advantage to the tree.

Summer Pruning.—This practice consists of pinching with the hand, or cutting off with the knife or secateurs some considerable portion of the current year's growth, and the object is, instead of permitting a lot of useless growth to be made, to endeavour to direct the energy of the tree in a more worthy direction, namely, the formation of fruit buds. It is the lateral shoots, that is those emanating from the sides of the branches, or from the spurs upon the latter, that are to be summer pruned. The leading shoots are best left alone, unless of course they are making unduly vigorous growth, when a slight stopping would do good. The side shoots must be shortened to within six leaves of their bases (the small leaves at the extreme bottom of the shoot must not be counted), in either of the ways above mentioned. The best time to do the work of summer pruning is about the middle of July. Care must be taken not to leave the shoot longer than the six leaves from its base before referred to, for we have found that often a fruit bud will form so high up the shoot as to be useless, since it has to be cut away at the winter pruning. Supposing, however, that one were pruning a shy bearing variety, and a fruit bud formed at some distance from the base of the shoot, it would be advisable to

leave this at the winter pruning, for one could gather the fruit and afterwards prune behind where the fruit had been.

Most of the fruit of the apple tree is of course borne upon short, stunted branches, known as spurs, and summer pruning encourages the formation of fruit buds upon these. When once a spur is formed it will continue to produce fruit buds for years in succession. There are some varieties however, in fact many varieties, that will fruit exceedingly well upon the young wood, and instances of this can often be seen upon the ends of the leading branches. Fruit buds will form along the whole length of the latter, and will in time develop into fruiting spurs, but they are usually too close together and should be thinned out. The spurs no less than the branches require to be regulated, but this can best be done at the winter pruning.

Summer pruning, then, may be thus summed up: It consists in shortening to within six buds of their bases, about the middle of July, all lateral shoots that are growing freely, with the object of encouraging the development of fruit buds on the lower portion of the shoot. If it happens that a fruit bud develop towards the apex of the shoot, leave it to bear fruit, and prune *behind* it during the next winter.

Winter Pruning.—If summer pruning is properly practised, the work at the winter pruning is considerably reduced. The shoots that were pinched back during summer to six buds, must now be cut back to within four buds of the base of the shoot. We do not find it advisable to prune harder than this, or the probability is that wood buds will be produced. January is a good month in which to prune apple trees, so that if possible the work should then be done. In many large gardens, where there is so much pruning of fruit trees to be ac-

complished, it is not of course possible to have the apple trees finished by the end of January, but that is immaterial. We have often pruned apple trees in March. A good sharp pruning-knife is preferable to secateurs, although the work takes longer to perform, but where pruning is necessary on a large scale secateurs must be used. At the winter pruning, all dead shoots and spurs should be removed, and the branches properly regulated. If any are growing inwards, shorten them back to a bud that points away from the centre of the tree. The same precaution is necessary when pruning the ends of the leading shoots. Always make a point of cutting back to a bud on the outside of the branch. Unless this important detail is attended to, the symmetry and fruit-bearing capacity of the tree also will be liable to deteriorate. If some of the spurs are becoming long, and too far away from the branches, say more than eight or nine inches, they must be shortened, as otherwise the flowers will be fully exposed to the spring frosts, and the fruits to the autumn winds. Thinning the spurs, too, must have attention; for, if they are allowed to become crowded, fruit buds will cease to form upon them, and their value will be lost. If, however, some are cut out altogether when it becomes necessary, they will continue properly to serve their purpose. Spurs upon the apple tree should not be less than six inches apart from each other. The fruit buds that form upon the basal portion of the shoot left at the winter pruning usually, but not invariably, need two years before they are capable of bearing fruit. In this case, the fruit bud becomes plump during the spring after the shoot is pruned, develops a few leaves in the following summer, and by the next spring is ready to produce blossoms, which should give fruit in the autumn of the same year. Sometimes, when the shoot is pinched during summer, the fruit bud will have developed sufficiently by the

following spring to produce flowers. It may, however, be too far away from the base of the spur to be of permanent value, and often must be cut away at a future pruning. With reference to the pruning of the ends of the branches, if these are of normal growth they may be left about nine inches long, but, if they are unusually strong or abnormally weak, leave them respectively a few inches longer or shorter.

SITUATION

A few words upon the situation and soil most likely to ensure the successful cultivation of the apple will not be out of place.

Shelter from winds is an important matter, and more particularly from the winds from the east and west. When the trees are in blossom in early spring, east winds are prevalent, and are liable to cause much damage if there is no shelter from that quarter. Rough winds are invariably experienced in the autumn, and these, as a rule, are from the west; the damage often done to apples that are then not yet ready for gathering being enormous. During one night irreparable loss may be sustained. It is wise, therefore, to select if possible a site that is in some measure protected from the east and the west. Some situations, notably damp and low-lying ones, are more subject to late spring frosts than others, and should be avoided. The prospect of a good season's crop may be changed during one night of frost in late spring to that of almost complete failure.

There are many fruit farms and gardens along the Thames Valley—generally speaking, a damp district—and although the country is well suited to fruit culture, so far as the soil is concerned, the trees are liable to suffer from the spring frosts so prevalent here.



A STUBBARD TREE IN SPRING

Sun is also a most important factor, for it is absolutely essential to the proper maturation of both wood and fruit, and therefore, upon no consideration, must apple trees be planted in a shady position. The growth made under such conditions will almost certainly become weak through improper ripening, and things will then rapidly go from bad to worse. If the shoots are not thoroughly matured, the buds upon them will be immature also, and will fail in the following season to produce good growths, which in their turn will also bear inferior fruits. Too much importance, therefore, cannot be attached to the selection of a site calculated, as far as may be possible, to have some protection from the east and west, and that is also exposed to the full sun.

SOIL

The apple delights in a deep loam, and the nearer to this the soil of one's garden approaches, the better will be the results, so far as soil has to do with them. The loam need not be rich, and it must not be more sandy than is necessary for adequate porosity. That it must be properly drained, goes without saying, for no fruit tree, or any other tree either, can be expected to thrive in a damp, waterlogged soil. Given a good loamy soil that is properly drained, either naturally or artificially, the apple tree ought to thrive. If the subsoil is of a sandy nature, no artificial drainage will be necessary, nor indeed will such be essential unless the subsoil is of a very retentive nature.

If, upon digging several holes in various parts of the land to be planted, water is found within three feet of the surface, drainage will be required; and, if no water is found, then it may be taken that the land is naturally sufficiently well drained. Supposing the

former to be the case, then three-inch drain pipes must be placed in rows about twenty feet apart, all sloping into a main drain laid across the bottom of that portion of the land towards which they slope. The main drain will, of course, carry the water off the land altogether. It generally happens that the prospective cultivator is not able to procure just an ideal piece of land, and he must therefore make it suitable by artificial means. A soil that is a heavy, clayey loam can be improved and made more amenable to culture, as can also light and sandy soils. For such as the former, lime rubble, road scrapings, and wood ashes are especially beneficial—they tend to make it more light and porous. For a sandy soil that lacks what is perhaps best expressed by the technical term “body,” leaf soil and decayed vegetable refuse, small lumps of clay, and farmyard manure will much improve matters. In a heavy soil, however, the great thing is to have thorough and sufficient drainage. A good mulch of farmyard manure during spring and summer is absolutely essential to satisfactory results if apple trees are upon an unusually light soil, for it prevents evaporation, and thereby keeps the roots much more moist than would be possible without such a covering. The autumn is the best time to improve the condition of the land, and land that is unsuitable for the cultivation of the apple should be made suitable before the trees are planted by the methods above mentioned.

In any case, the ground that is intended for dwarf trees upon the Paradise stock should be trenched from two to three feet deep if this has not been recently done.

SUMMER TREATMENT

The weather experienced during the summer will to a large extent determine the amount of work to be

done. During hot and dry weather much time will be taken up by watering, and even this work, if mulching is well attended to, will be lessened. The value of a good mulch cannot be over-estimated. Hoeing with a Dutch hoe also has a very beneficial effect upon the soil in hot weather, and should be frequently practised. By its means the loose soil closes up the pores of the land surface, and thus prevents the escape of moisture from below. Water is best applied either in the early morning or in the evening, for then it has an opportunity of well soaking into the ground before the sun shines with force. It is almost useless to give water in the middle of the day with the hot sun striking upon the ground, for it is dried up again before it has a chance of even entering the soil, much less of reaching the roots of the trees.

Early or late watering, a good mulch of manure for a few feet around the base of the tree, and a free use of the hoe, will tend to lessen the severity and labour of watering during a hot and dry summer, and will also materially assist the trees in passing through it successfully. Summer pruning will have to be attended to, and the method of doing this has already been explained. A sharp look-out must also be kept for the attacks of insect pests, black and green fly—or “blight,” as it is popularly called—being often troublesome, and making its appearance early; but with this pest, and its prevention and cure, we shall deal in a later chapter. There is nothing like a hose for watering fruit trees, as these can then at the same time be well washed down, a practice that does them a world of good, for it tends to keep them free from insects and other pests, as well as to encourage them to make good growth.

Thinning the fruit is an important item, and one that is very often much neglected. In some seasons, it

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is not necessary. There are occasions when hardly half a crop remains, either by reason of an untoward spring that prevented the flowers from "setting," or a wet autumn that did not allow the wood and the buds an opportunity of ripening. In such cases it is hardly necessary to state that thinning is not required. There are, however, on the other hand, seasons when there is a superabundance of fruit, and in order to have, in the autumn, apples of the best size and quality, a judicious thinning out must be resorted to. Unless the crop is an unusually full one, it should not be necessary wholly to remove any of the bunches, but to take just a few fruits from each. It is impossible to expect good fruit unless some are taken off when one has a "heavy set." Even if they would swell to a normal size they could not, as they are so closely pressed against each other. The fruit at the apex of the bunch should always be left, unless, of course, it happens to be deformed or bruised, for it usually develops into the best fruit.

A judicious thinning of superfluous fruits is a feature of apple cultivation that must not be overlooked. The ultimate size of the fruits must be borne in mind when thinning, for it would not, of course, be possible to leave in a bunch so many of the larger growing sorts as of the smaller varieties. It is unwise at any time to burden an apple tree by allowing an unusually heavy crop of fruits to ripen. Such a practice must to a certain extent prevent a proper growth being made, and if the tree fails to grow well even for one season, it must adversely influence its fruit-bearing capacity for some time to come. One often hears of apple trees producing heavy crops of fruit for several years in succession; and this may happen, without apparent harm immediately resulting. The tree cannot, however, bear a heavy strain upon it, as this undoubtedly would be, for several

years without in some way suffering. It may not be for some years to come, but it will undoubtedly be noticeable in the failure of the apple tree at a comparative early period of its existence, or perhaps in its being permanently weakened. It is far more satisfactory to be content with an average crop year by year, for a tree will then bear good fruit over a much longer period than if it is overcropped early in life.

GATHERING AND STORING THE FRUIT

The gathering of the apple should properly extend over a considerable period, for the ripening of the numerous varieties now in cultivation begins in July and continues over several months. The bulk of apple gathering is, however, done in October; for it is not safe to leave the fruits on the trees after then, because of the stormy weather often experienced in November, and most varieties are sufficiently advanced to gather at that late season. Generally speaking, the early varieties do not keep long; being fit for use only for a few weeks after gathering. It is indeed the fact of their being ripe so soon that makes them of value, for there are scores of mid-season varieties. It is not difficult to determine when these early kinds are ready to be picked, for, apart from the aroma that they have, if one will take the trouble to smell them, the fruits will easily part from the tree at the base of the stalk, when they are sufficiently ripe to be gathered. There is but a small number of early fruits as compared with those to be gathered later, and they require no storing; for the simple reason that they are ready for table or market, and therefore do not need to be kept until ripe, which, of course, is the chief object in storing apples. If our climate were such as to permit the cultivator to let the fruits remain upon the

trees until they were ripe, a great deal of the storing that is now necessary could be dispensed with, but, as before remarked, as it is neither safe nor wise to leave our apples upon the trees after early November or late October, gathering and storing are essential to the preservation of a winter and spring supply. Some of the varieties will be ripe when they are gathered, but the majority of the mid-season and late ones will not. There is one important point to be observed in the gathering of apples, as indeed of all fruits, and that is, to take great care not to bruise them. Half the battle of successfully preserving apples throughout the winter lies in the thorough observance of this detail; for, if an apple is bruised when gathered, decay is almost certain sooner or later to be the result. Therefore handle the fruits with much care, placing them gently in the baskets made use of. Our method of gathering apples (where great quantities were put away) was to have large oblong-shaped baskets about two feet six inches wide and five feet long. These were placed upon a spring barrow able to carry three together, and were thus ensured a journey to the fruit-room free from jolting, the construction of the barrow on springs being such that it gave upon the slightest resistance. Were the baskets of fruit placed upon an ordinary barrow, they would probably be badly bruised by the time they reached the fruit-room, as each stone or dip in the road encountered would in some measure disarrange the fruit. As the apples were gathered from the tree, they were placed into a peck-basket, which is lined inside with leather. This basket had a handle that enabled one, by means of a double iron hook, to hang it to the rungs of the ladder. It would be almost impossible for a man to hold the basket in one hand and gather the fruit with the other. When the peck-basket was full it was lowered, and the

fruit placed in the baskets upon the barrow; and when all those were full, they were wheeled away to the fruit-room. The person who is actually gathering the fruit must know how important it is that it should not be bruised, for no amount of care taken afterwards can undo any damage done in picking the fruits from the tree. No time is lost if the method described is properly carried out. There should be two barrows in use, and at least two men gathering, as the fruit-room will probably be some little distance away. The baskets on the one barrow will thus be filled by the time that the other one returns.

Having gathered the fruit carefully and expeditiously, it is most important to have a suitable place in which to store it. The subject of fruit storage is one that has quite recently attracted the earnest attention of fruit growers, and much correspondence has appeared in the horticultural press upon this matter. It may perhaps be helpful to give the views of one or two leading fruit growers upon such an important topic. The two following letters from Mr W. Crump, head gardener to Earl Beauchamp at Madresfield Court, and Mr George Bunyard of The Royal Nurseries, Maidstone, respectively, were contributed to *The Garden*, of April 13, 1901. Mr Crump says: "We are of opinion that the thorough ripening and the proper means of storing hardy fruits do not generally receive half the care and attention that the matter deserves, especially by those who really require a long, successional supply of firm, well-conditioned home-grown fruit. In our modern fruit-rooms, utility is frequently sacrificed by architects or builders for structural appearance; we, ourselves, were victims to this policy, and owing to the dry, arid atmosphere of our fruit-room we found it impossible to keep apples firm after March, and nothing that we could devise would prevent shrivelling and toughening

of the fruit. However, 'necessity is so often the mother of invention,' that we commenced trying experiments. First, we tried placing the fruits in barrels, on the American plan, as gathered from the trees. This preserved the firmness of the fruit; but from being packed in bulk the flavour was very much impaired, and the fruit appeared to lose its juiciness and briskness of flavour. At that time the bulk of those kinds had to be purchased from the farm, whereas now our own surplus runs into tons; but even this would not, under the old system of storing, maintain the required supply after the month of March. Our next experiment was in an ordinary cellar, and here we found that the fruit kept as firm and as sound several months longer as when gathered. In fact, we were so convinced of the advantages of an underground cellar that we decided at once to adopt the Irishman's method of raising the roof of his cabin by 'lowering the floor.' We consulted a builder, and he undertook to excavate the interior of the room, so as to form an additional seven feet for shelves, underpinning the walls to form the cellar. Iron girders were thrown across, and the original floor was replaced thereon: an opening shutter was let in the floor of the interior at the one end, and another door through the outer wall at the other end, giving access both from the exterior or interior, and affording ample and necessary ventilation during the sweating operations shortly after being gathered. A current of air is thus allowed to pass through the underground stores of long keeping fruit until the skins have parted with their surface moisture; and then, taking advantage of a cold morning, we shut up the cellar with the coldest air, only ventilating again when we can exchange for a fresh supply of cold air. The more moisture on the floor the better. The important point is to dry well the surface of the fruit before



SUMMER SNOW

finally closing. The fruit may be placed in two or three layers, or singly. The best temperature we consider to be about forty degrees to forty-five degrees. Cool storage, with co-operative fruit growing, would revolutionise our home productions in a commercial sense if thoroughly applied."

Mr Bunyard writes with reference to rational storage for apples. "My building has often been quoted and described. It may shortly be called a common-sense store, but I cannot too strongly impress upon all those who wish to keep their fruit firm, fresh, and for a long period, that it is most important that it should first be well matured on the trees, then be very carefully gathered, and finally be laid without bruising on the shelves, and that the floor be always kept moist.

"Capital storage is ready to hand in the many oast houses which exist in Kent and Sussex, as the hops are generally gone and the oast cleaned out before the apples for late keeping are gathered. There is no doubt that these substantial buildings are suitable both on the ground floors and on the first floors, but the former keeps the fruit best.

"The usual plan is for women to sort the fruit as it comes in, and to lay it out carefully on clean straw in heaps of one sort up to three feet deep. After these heaps have sweated, they are slightly covered to keep off dust, etc., and then as frost becomes probable they are covered one foot deep with straw quite fresh and clean. In these heaps the fruit keeps sound and plump, and they are stored into January or March according to the market price.

"Naturally a dry fruit like Blenheim Orange keeps better than Wellington which rots into a pulp. But the great difficulty is that so many kinds are grown that a continual supply of well-known sorts cannot be kept up. I have advocated the erection of large stores,

where fruit from a district could be collected in large quantities. I am told that a firm of salesmen did this in a plentiful year, buying up at a low price all suitable "keepers" they could lay hands on, and this not only helped prices of other sorts at the time, but they placed them after five months storage on the market at a large profit, showing that combination would pay if it could be extensively carried out.

"The sorts now most favoured for late sale are Wellington, Blenheim, Winter Queening, Northern Greening, Deux Ans, Norfolk Beaufin, Cox's Orange Pippin, Golden Knob, and Wyken Pippin; and, locally, Hanwell Souring, Grange's Pearmain and Court Pendu Plat. But in a few years there will be a large growth of Tower of Glamis, Newton Wonder, Bismarck, Hambling's Seedling, Royal Jubilee, Lane's Prince Albert, and Bramley's Seedling.

"Year by year the home-grown supply gets larger, and it may be possible to keep up a regular supply when a system of storage is largely adopted, and it is in this direction that English apples for the English public may be provided. The largest crop ever grown was, perhaps, in 1900, and yet it is a fact that better prices were obtained for keeping apples than in previous years."

With reference to the subject of fruit storage, Mr Owen Thomas, head gardener to Her late Majesty Queen Victoria, says, in speaking of specially built cool fruit rooms: "It is not the extreme cold here which is called into requisition to retard maturity, but rather the arresting of evaporation by the equability of the temperature for a long period of time, say, from when the fruit is gathered until it is ripe. I am of opinion that much may be done on this principle. Indeed, this has already been demonstrated by Messrs Veitch, Bunyard and Crump. Messrs Bunyard especially have shown what

can be done in this way in preserving apples, by their wonderful exhibit of perfectly preserved fruits in great variety on several occasions at the Temple Show towards the end of May. Messrs Veitch and Bunyard have built their cool fruit rooms above ground, and encased them with a thick covering of heather. In the Royal Gardens, Windsor, we had a cool fruit room built underneath our pear room, and it has answered admirably. The temperature never falls below forty degrees in the coldest, and seldom rises above sixty degrees in the hottest weather, thus securing such an equable temperature and freedom from evaporation as would be impossible in an ordinary fruit room."

We see then that the ideal surroundings for keeping apples sound and in good condition throughout the winter months may thus be summarised: An equable temperature of from forty degrees to forty-five degrees Fahrenheit, and an atmosphere that is moist. Therefore, any room or building that is so adapted as to be able to fulfil these conditions may be successfully made use of for the storage of apples. Until the underground fruit room was built in the Royal Gardens, we stored practically the whole of our apples in a large lean-to wooden structure, with a thatched and slated roof. This was built against a wall and faced due east. For the perfect preservation of pears, which are certainly more delicate than are apples, the underground room has proved of advantage, for it is evident that in such a place the temperature will not be liable to fluctuate nearly to the same extent as it would in a building completely exposed to external atmospheric influences.

It may, however, be safely stated, without fear of contradiction, that an underground fruit room is not necessary for the successful preservation of apples throughout the winter, however desirable it may be for

the storage of pears and other soft and delicate fruits. For this purpose it is indisputably of great value, as we have proved at Windsor. Both Mr Bunyard and Mr Crump emphasise the necessity of allowing the fruits to "sweat," that is to say, of allowing their surfaces to become perfectly dry before the fruit room is closed for the winter. The best means of ensuring this is to allow a free current of air to pass round about the fruits for a few weeks after they are first placed in the fruit room. It is important also to close the latter during cold weather, thus bottling up a supply of cold air. Providing that the surfaces of the apples are well dried, as above directed, no harm will be done by storing the fruits in several layers, one upon another. Mr Bunyard even places them in heaps, three feet deep, and finds that they keep thus perfectly sound, providing that "sweating" has properly taken place. Mr Crump stores his fruits in three layers immediately upon each other, and we have often been obliged to place them much more thickly than this when an unusually heavy crop has been gathered. It does not apparently make much difference whether they are placed in single, double, or treble layers, or even more thickly, providing that the apple surfaces are first well dried, that the temperature of the room is equable and suitable, and that the atmosphere is moist. This last mentioned item is an important one, for unless it is attended to shrivelling will almost certainly result.

ROOT PRUNING

Root pruning is a matter that, sooner or later, has to be considered by almost every one who attempts the culture of the apple, and a right knowledge of its performance is necessary. Some varieties of apples there are that naturally grow vigorously; trees may be

planted in soil that is of an unduly and injuriously rich composition, thus causing a too free growth; or the roots may descend into a sour and unwholesome subsoil. Each of these conditions is conducive to unfruitfulness, and necessitates the practice of root pruning. The primary object, as indeed the need, of root pruning, is to encourage fruitfulness, and it is usually made necessary by one of the three conditions above mentioned. Young and newly planted trees, if they are treated well, are often liable to make an exceptionally vigorous growth, and this and fruitfulness rarely go together. Some varieties are more prone to this fault than others, and are naturally so strong growing as to require being kept within bounds in even ordinary soil. When roots find their way into the subsoil, especially if this is at all waterlogged, the tree is almost certain to be unsatisfactory; gross, unfruitful shoots will develop, and canker may probably also arise from the same cause.

We see then the object of root pruning, and the next thing is to learn how it should be done. It is important to remember that moderation is equally necessary in root pruning as in branch pruning. If either is carried to excess, or is injudiciously practised, much more harm than good will result. I remember a number of splendid apple trees, of the variety Lord Grosvenor, that were growing somewhat vigorously, and orders were given for them to be root pruned. They were then bearing fairly well, but not well enough to give full satisfaction. The work was overdone, with the result that the trees were crippled for several years, and they are now but just regaining their normal strength and bearing. Such an example reminds one how much harm may be done by injudicious root pruning. If carefully and wisely performed, however, it is a valuable means of inducing trees that have not been doing so to bear.

fruit regularly, and also of keeping others in such a condition as will enable them to continue to produce satisfactory crops. The method of root pruning to be adopted will depend upon the size and age of the tree, for the more advanced it is in years and vigour, the more care will be required. A young tree is less affected by the shortening of some of its long, fibreless roots than is an older tree.

The first thing to do is to dig a trench at a certain distance from the stem of the tree, and the size of the latter will regulate the distance at which the trench is to be made. For instance a young tree, having been planted say two years, and in need of root pruning, would not be harmed if a trench were opened all around it, and only four feet from the stem. In the case of a tree that had been in its place for say ten years, such a proceeding would be positively harmful. It is the practice of many cultivators to adopt the plan of making the trench just outside the ground covered by the branches of the apple tree, that is to say, the position of the trench is regulated by the spread of the branches. This may be taken, generally speaking, as a reliable guide. Having opened a trench about fifteen inches wide, the *inside* of the trench being just *outside* where the branches cover the ground, take a fork and with this proceed to remove some of the soil from underneath and towards the centre of the mass of roots, thus leaving the upper portion of the soil and roots intact. To disturb this latter portion is in the first place useless, because there are no offending roots there, and it is also harmful, because it contains most of the fibrous, and, therefore, the most valuable roots, and these would consequently be disturbed and damaged. As the worker removes the soil from underneath, all around, he will be certain to meet with some of the roots that need pruning. They may be recognised by their long, strong and

fibreless appearance, and by their growth in a downward direction. It should be stated that the trench need not be more than two feet or so deep for small trees and three feet for large ones.

The roots must be cut back before they enter the inferior or perhaps unwholesome subsoil, and the manner in which the cut should be made is of importance. If made in a descending direction, any roots afterwards emitted will almost certainly grow downwards, but, if the cut is made in a slanting direction upwards, the rootlets that in time make their appearance will also grow towards the surface. All roots found to be pushing down towards the subsoil should, after they have been cut as advised, be lifted and placed in a horizontal position. It may not perhaps be necessary to have them exactly horizontal, but the idea to be aimed at is to prevent their continuing to descend and to enable them to get nearer the surface, where they will be benefited by the warmth and air. The fact of making the trench all around the tree will to a certain extent be a root pruning in itself, for some of the undesirable roots will most probably have penetrated so far and be cut through by the spade. All roots that are so cut must afterwards be carefully gone over with a sharp knife and the bruised ends again cut, as previously described. Fresh soil placed in the trench to replace that removed, when all the necessary root-pruning is finished, goes far to re-establish the offending roots in their proper positions, for roots will invariably find out new material if it is anywhere within their reach.

INSECT PESTS

The apple tree is liable to the attacks of various insect pests, of which the most harmful and generally

met with are American Blight, aphides, apple weevil, winter moth, codlin moth, and scale. Each of these if left alone is able to do a very considerable amount of damage to the tree and its crop of fruit, so that it behoves the cultivator to know how to take preventive and curative measures against these pests. A great deal can be done to prevent their appearance, and almost all preventive measures are founded upon cleanliness. This applies to all departments of the garden, for, whether it be flowers, fruits, or vegetables that are concerned, the best way to ensure the non-appearance of insect pests is to keep the plants clean. Another great aid to the prevention of the attacks of insects is to keep the plants healthy and vigorous, for it is well-known that plants in ill-health are invariably the first to be attacked.

Much can be done to ensure the cleanliness of one's fruit-trees by never allowing heaps of rubbish to remain about, and by making it a rule to take away and burn all prunings, clippings, etc. Small heaps of vegetable refuse in corners of the garden are favourite spots for insects to breed in. Bullfinches and sparrows are perhaps the only two birds generally acknowledged to do more harm by destroying buds and fruit than good by catching injurious insects; as a rule, however, the good accomplished by birds in the garden is enormous, and greatly exceeds what little damage they may do to the fruit crop.

Aphides are a very common pest in the fruit garden; for they attack the foliage of the majority of fruit trees, and will, if not destroyed, greatly disfigure and injure the trees. The leaves curl up, and the growth of the shoots is crippled. There is perhaps no garden insect that increases more rapidly than do the aphides, or green and black fly, as they are commonly called, and preventive measures should be taken in good time, otherwise it will be a difficult matter to keep them down.

For some time past we have made use of a mixture of paraffin, soft soap and water, that we find of great assistance in repelling the attacks of these insects. We make sufficient of the mixture in the following proportions, to fill a large water tub that is fixed on a framework with wheels, thus enabling one to take it to any part of the garden: warm water, two gallons; soft soap, one pound; and two wineglasses full of paraffin. If this emulsion is well mixed together by means of the syringe before being used, it will, if applied to the points of the shoots, where the aphides are usually to be found, effectually dispose of them.

American Blight is one of the worst enemies the apple has to contend with, and if allowed to establish itself in an orchard is difficult to get rid of. It will be known to most readers by its white woolly appearance, though this, which many people believe to be the American Blight, is simply a secretion from the bodies of the aphides. These feed upon the tissues of the bark and the underlying layers. As this pest spreads very quickly the cultivator should keep a sharp look-out for any signs of it, for if taken in time it is not difficult to destroy. The best plan when the trees are not badly affected is to go over the infested portions with a brush dipped in methylated spirit. If, however, the blight has become well established, the bark affected must be first scraped off and burned, and the portions underneath thoroughly cleansed with some insecticide, for which purpose none is more effective than caustic soda solution. It is made thus: dissolve one pound of caustic soda in one gallon of water; add three-quarters of a pound of carbonate of potash: stir until all is dissolved, and add nine gallons of water; then add six pounds of soft soap previously dissolved in a little boiling water, and well mix the ingredients together.

The Winter Moth.—The caterpillars of this moth

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attack the young leaves and flower-buds of the apple in the early spring, and often do a very great deal of damage if wise precautions are not taken beforehand. The favourite and most satisfactory method of preventing the ravages of the caterpillar of the Winter Moth is to attach sticky bands around the stems of the apple trees early in the autumn. This is done to prevent the females, which are wingless, from reaching the buds, where they would otherwise lay their eggs. The bands made use of must be grease-proof, so that the grease (cart grease is excellent) may not penetrate to the bark of the apple tree. The grease should be well smeared over the bands, which are placed at a height of twelve or fifteen inches from the ground. Should it happen that some females have managed to reach the buds and there deposited their eggs, a spraying with a paraffin solution (two gallons of hot water, one pound of soft soap, and two wine-glasses full of paraffin added before the water cools) if any injury to the young leaves or flower-buds is noticed, will be effectual. Do not use this mixture upon fully-expanded flowers, or their vital organs will probably be destroyed.

The Apple-Blossom Weevil.—The females of this insect also lay their eggs in the young fruit buds of the apple, and the grubs eventually feed upon the expanding blossoms with most disastrous results. After the eggs are laid it is useless to attempt to destroy them with insecticides, for these cannot effectually reach them. All that one can do is to shake the trees well, having first placed cloths underneath to catch all the weevils that may fall. The latter can afterwards be destroyed by emptying them into boiling water. Any flowers that have been attacked and have fallen to the ground should at once be gathered and burned. It is most important that no refuse of any kind be allowed to remain around the base of the tree, as such offers an excellent winter home for the weevils.



“Under deep apple boughs
My lady hath her house.”

To make the stems of the apple trees unsuitable as a hiding-place for the weevils remove any projecting pieces of bark, and paint the stems with lime wash.

The Codlin Moth.—Unlike the two previously mentioned pests, the Codlin Moth does not attack the fruit until this is well formed. As the fruit develops, the caterpillar eats its way into the centre of the apple. It feeds upon the latter until it is fully developed, when it eats its way out again, and finding a crevice in the bark of the stem perhaps, there spins a cocoon. The moths emerge in the spring to lay their eggs in the fruits. Much may be done to get rid of this pest by collecting all fruit that has fallen, and all that will fall when the tree is well shaken, and burning it; for probably the fallen fruits will each contain a caterpillar. Remove the rough and loose bark from the stems of the trees, and dress them with the paraffin solution (advised for use against the Winter Moth), so that they are rendered objectionable as winter homes for this insect. Many cultivators place bands of hay around the stems to trap the caterpillars that then are climbing up. The bands must be examined, and all caterpillars found be destroyed.

Scale Insects do not cause nearly so much damage as do the pests previously mentioned. They are, however, very objectionable, and if allowed to go unchecked disfigure and injure the fruits. The best way to get rid of them is to syringe well the affected portions of the branches with the paraffin solution before described, using it quite warm, and repeating the practice several times at intervals of a few days.

VARIETIES

A careful selection of the best and most suitable varieties is of the utmost importance, for, without this,

practically all care and labour bestowed on the culture of the trees are really lost. There are many varieties that are not worth growing, so that to expend years of toil upon cultivating such would obviously be an unsatisfactory task. It is essential, therefore, to grow the best varieties of apples, and the best only, for there is an ample choice of good kinds, and no necessity whatever even in making a numerous selection to include any worthless ones. We will first take the dessert varieties. It is usually the object of the planter to include in his collection those kinds that will provide a supply of fruit over as long a period as possible. For instance, he will choose very early, early, mid-season, and late ones, so as to ensure an unbroken supply of apples throughout the winter. In order to suit the needs of both small and large planters, we shall give lists for the guidance of each.

It is advisable for the would-be fruit grower to ascertain if, in his particular district, there are varieties that succeed unusually well, for much useful information may often be gleaned in this way. Should it be found that certain kinds are uncommonly good, then it would be unwise not to plant at least a few trees of each of those particular ones. Occasionally one comes across a very good local variety, that is to say, one that is known only in a certain neighbourhood, and does not appear in a general catalogue of fruits, simply because it is restricted to a small district.

Ripe apples may be had even in July, although they will not be very large. One cannot, however, be too exacting at such an early season, for, no matter how well fruits stored in the previous autumn may have kept, there is always a certain brisk and palatable flavour about fresh apples that makes them more enjoyable, and one is therefore glad to be able

to pick them from the trees in July and August. Those who wish to plant early varieties cannot afford to be without Mr Gladstone, Beauty of Bath, White and Red Juneating, and Irish Peach. These are all good dessert apples, and well worth growing for an early supply. Mr Gladstone bears excellent crops when grafted on the Paradise Stock, and is, on account of its free bearing qualities, valuable as an early market kind. White Juneating, also known as July Pippin, and Red Juneating, also called Margaret, both bear well as dwarfs, and as standards on the Crab Stock also. Irish Peach is a splendid early fruit, and it bears well, growing either as a pyramid or standard. Of apples that will carry us through September, we have Kerry Pippin, Devonshire Quarrenden, Lady Sudeley, and Duchess of Gloucester. Kerry Pippin is an excellent little apple; it is small and very sweet, and the tree crops heavily. In common with most of these early varieties, Kerry Pippin apple may be picked off the tree almost ripe. None of them will keep for long, nor indeed is it necessary that they should.

Devonshire Quarrenden is another indispensable fruit of medium size, handsome, and agreeably flavoured. Lady Sudeley and Duchess of Gloucester are undoubtedly two of the most beautiful early apples we have, and no less useful than beautiful. Mr George Bunyard introduced the first mentioned in 1885, and writes thus concerning it: It is best when eaten from the tree, and will then remain a month in use, but loses flavour when stored. It bears on the points of the shoots, and therefore must be allowed to grow naturally, with slight pruning. It succeeds in Scotland and Cornwall, and is grand in the orchard-house. Apple Duchess of Gloucester, although rather small, is produced abundantly, and in colour is a bright red.

The months of October, November and December

are well provided for. A few of the best apples then available are Margil, King of the Pippins, Ribston Pippin, Cox's Orange Pippin, Allington Pippin, Scarlet Nonpareil, and Adam's Pearmain. Cox's Orange Pippin and Ribston Pippin are too well known, and their first-rate qualities too well recognised, to need many words of recommendation. The first-mentioned has been for many years, and still is, admitted to be the best flavoured apple in cultivation. It succeeds either as a standard or a bush, and should, if possible, be planted in a good warm soil. In poor or heavy land, not thoroughly drained, it is liable to prove somewhat disappointing. Ribston Pippin Apple is also a variety of long standing and great merit. It obtained its name from Ribston Park, Yorkshire, now the residence of Major Dent. The following short account of its history is preserved there: "Sir Henry Goodricke being at Rouen in 1709, procured some fine flavoured apples, the pips of which he sent to Ribston. Three of them grew, but only one tree proved worth keeping, viz. The Ribston Pippin. The trunk of the old tree was blown down about 1828. Our present tree is a sucker from the old roots, and therefore true." Some growers have an idea that this grand old variety is predisposed to canker, but we have not found it so, providing that trees are obtained upon the Paradise Stock and planted in ground free from stagnant moisture.

Allington Pippin is a comparatively new apple, for whose introduction, in 1896, we are indebted to Mr George Bunyard of Maidstone. We have found it to be an excellent apple, of medium size, somewhat similar to Cox's Orange, but more conical. It is a reliable cropper, thriving either as a bush or as a standard, and the flavour is very good. Adam's Pearmain is a fruit of most distinct appearance, true cone-shaped, with a handsome spotted skin, and has a brisk, pleasant flavour.

It is altogether one of our most reliable early winter varieties. Scarlet Nonpareil is a crisp and juicy fruit, somewhat small, beautifully coloured, and does best when grown as a bush upon the Paradise Stock. After Christmas, for at least six or eight weeks, there should be no dearth of good apples, for several varieties are at their best during that season. Worthy of special mention are Claygate Pearmain, Rosemary Russet, Fearn's Pippin, Cockle's Pippin, Lord Burghley, Christmas Pearmain, and Mannington's Pearmain. Of these, Cockle's Pippin, Lord Burghley and Christmas Pearmain are perhaps the least well-known, although they are by no means the least worthy of culture. Cockle's Pippin is of a greenish-yellow colour, retains its flavour over a long season, and Mr Bunyard credits it with succeeding well near the sea. Lord Burghley is a fruit of excellent flavour, and does best when grafted on the Paradise Stock. Christmas Pearmain is perhaps not so well known, by reason of its comparatively recent introduction (1895, Bunyard). The introducer says of it: "Medium sized, of excellent flavour, with scarlet cheek and russet markings, an enormous cropper; the tree is a good grower, free from canker."

During March, April and May the number of reliable varieties available is narrowed down very considerably, although we still have such good things as Court Pendu Plat (the Wise Apple), Sturmer Pippin, Roundway Magnum Bonum and Braddick's Nonpareil. Mr Owen Thomas says of the latter: "It is impossible to speak too highly of this as a late dessert apple. It is of medium size, possesses a russety colour, and has the flavour of Ribston Pippin. The tree succeeds well as a bush or pyramid, and is a certain and sure bearer, especially on the Paradise Stock." With reference to Sturmer Pippin, the same writer says: "This is certainly one of the

most reliable cropping varieties we have. It is of good size, and, if not of the very best appearance, is yet one of the most useful late dessert apples we possess." Mr Owen Thomas says of Court Pendu Plat: "The Wise Apple, so designated from the fact of its being the latest variety of all to open its blossoms in spring, as though conscious of the serious damage wrought by late frosts to apple blossom in the month of May, is a distinct and useful late apple either for cooking or dessert. It is not so constant a bearer as some, occasionally missing a season altogether, but it makes up for this eccentricity by bearing extra heavy crops in the following year." Of Roundway Magnum Bonum, he says: "Some authorities have gone so far as to say that this old apple is superior in flavour to Cox's Orange Pippin, but this, in my opinion, is an exaggeration not justified. It is, however, a variety well worth including in every collection, for it has size, handsome appearance, fruitful nature, and sweet aromatic flavour."

The above-mentioned varieties are just a few picked from the innumerable lists of sorts that are now issued, and they all may be relied upon to prove satisfactory when given fair treatment. So many people are now becoming interested in fruit culture, and particularly in that of the apple, that we shall give selections of both dessert and kitchen varieties suitable for gardens, large and small. A tabulated list has the advantage of being easily referred to. By placing together varieties that are ripe in any particular month, a further convenience is attained, as, if the grower wishes to plant either early, mid-season, or late varieties, he may see at a glance how many good kinds he has to choose from.

We would first like, however, to make a few remarks upon some of the leading kitchen apples. In August, September and October there are several good culinary

apples that are ready for use, notably Ecklinville, Frogmore Prolific, Lord Grosvenor, and Stirling Castle. Ecklinville Seedling, to give this variety its full name, is one of the very best culinary apples we have. It grows well either as a standard or as a pyramid, is large, and bears abundantly. It is a variety that should be planted largely. Frogmore Prolific is one that was raised in the Royal Gardens, Windsor, some years ago, and still continues to rank high in the list of culinary apples. It makes a splendid pyramid, the fruit attains a good size, has a bright, clear skin, and is produced abundantly. Lord Grosvenor also is an apple that cannot be well dispensed with. Very large, a vigorous grower and free bearing, often recommended in preference to Lord Suffield, a variety that is somewhat fastidious as to soil and situation, it is worthy of being widely grown. Stirling Castle also is strongly to be recommended, particularly as a dwarf upon the Paradise Stock, in which manner it fruits remarkably freely.

As Christmas approaches, we look forward for our supply of kitchen apples to such kinds as Newton Wonder, Mère de Ménage, Warner's King, Lane's Prince Albert, Golden Noble, Stone's Apple and Bramley's Seedling. Of these varieties Lane's Prince Albert is hard to beat. We have bush trees of it, on the Paradise Stock, that bear remarkably good crops of fruit, and the individual fruit is fairly large and handsome. For planting in the garden proper, bushes or pyramids of this variety are of great value, and it should on no account be omitted from any collection of kitchen apples. Newton Wonder and Bramley's Seedling, the former of recent introduction, are large and handsome fruits.

The first named is a cross between Wellington (a valuable culinary apple) and Blenheim Orange (a good sort that is used both for dessert and kitchen), and is certainly one of the best additions to our list of

cooking varieties for some time past. Either as a standard or a bush it succeeds, and we have some grand trees of it in the latter form. They have not long been planted, but they have done remarkably well, and have proved how good a thing Newton Wonder is.

Bramley's Seedling also makes a good bush on the Paradise Stock, and is a good fruit. Golden Noble is very highly thought of by some cultivators. It is one of the most beautiful culinary apples, in colour a bright golden yellow. It bears fairly well, but we find that it is rather a bad apple to keep for any length of time. It can be recommended, but a few trees only should be planted. Warner's King and Stone's Apple, or Lodington's Seedling, are both good, the former being a very large fruit. Mère de Ménage, too, is a popular variety, the fruits being large and handsome, in colour a dark crimson, mottled and striped; but they are not, as a rule, very abundantly produced, although the tree improves in this respect as it grows older.

From December onwards we have Sandringham, Wellington (Dumelow's Seedling), Striped Beefing, Northern Greening, Royal Late Cooking, Gooseberry Apple, and others. The Sandringham is a large apple, of good quality, hardy, and a free bearer. It has received a first-class certificate from the Royal Horticultural Society, and should be included in every collection, if only from its value as a late keeping variety. Wellington, or Dumelow's Seedling, is the cooking apple *par excellence*. It has a sharp, acid flavour, which it retains until quite late in the season. Her late Majesty, Queen Victoria, was especially fond of baked Wellington apples, and so long as these could be obtained (and they can be had in the market as late as most culinary varieties) would have no other. As a standard it succeeds best, making a fine tree; it may, however, be grown as a



• A FLANDERS PIPPIN

bush upon the Paradise Stock, and as such bears remarkably well. It is not so large as several of the cooking apples, although it is of a good size. It is greenish yellow in colour, sometimes tinged with light red on the sunny side.

Striped Beefing and Northern Greening are two good winter cooking apples, and may be grown either as bushes or standards. The first named, like *Mère de Ménage*, previously mentioned, bears better when it has reached a more advanced age. *Royal Late Cooking*, although by no means really a new apple, has only quite recently been offered to the public. It originated in the Royal Gardens, Windsor, some years ago, and, when exhibited before the Royal Horticultural Society in 1896, received an award of merit. A large, handsome, greenish yellow fruit, that keeps well, *Royal Late Cooking* forms a good standard tree, and is to be recommended. The *Gooseberry Apple* is a good old culinary variety, and one that is now seldom heard of. It is nevertheless a valuable late kind of medium size.

LISTS

DESSERT VARIETIES

<i>Variety.</i>	<i>Remarks.</i>
Mr Gladstone.	Ripe in July and August; a pretty, well-coloured fruit; bears freely on the Paradise Stock; good early market apple.
Beauty of Bath.	A very handsome, bright red fruit, of good flavour; Paradise Stock; ripe in August.

<i>Variety.</i>	<i>Remarks.</i>
Irish Peach.	A medium-sized, juicy apple ; one of the best early (July and August) varieties ; bearing well as an orchard standard or pyramid.
Cardinal.	Peter the Great is a synonym of this Crimean apple, which is a handsome, well-coloured, medium-sized fruit. The flesh is soft, so that this kind must not be kept long. An abundant bearer. August.
Red and White Juneating.	The White Juneating is small but very good and prolific. In favoured districts it is ripe early in July. The Red Juneating, or Margaret, is rather larger, and a good early variety. Makes either a pyramid or an orchard standard.
Lady Sudeley.	Jacob's Strawberry is the name sometimes given to this valuable September apple, presumably from its brightly-coloured and handsome appearance. Best eaten from the tree. But little pruning required.
Worcester Pearmain.	Of medium size, and good flavour ; ripe in early September. An abundant bearer upon either the Paradise or Crab.
Devonshire Quarrenden.	A richly-flavoured, dark red, medium-sized fruit that is produced abundantly. A valuable kind, doing best on the Paradise Stock.
James Grieve.	This apple was introduced from Scotland, and received an award of merit from the Royal Horticultural Society in 1897. Of medium size,

<i>Variety.</i>	<i>Remarks.</i>
	and a flavour approaching that of Cox's Orange Pippin, it will thrive where the latter will not, as it is much hardier. It bears well.
Kerry Pippin.	An old, well-known, small variety of splendid flavour, bearing well either as a standard or pyramid.
Summer Golden Pippin (<i>Yellow Ingestre</i>).	A handsome, bright yellow, well-flavoured September apple, forming prolific bushes on the Paradise Stock.
Red Astrachan.	This is a large and beautiful fruit, of fine flavour, that should be eaten from the tree. This variety bears freely as a pyramid on a warm soil. September.
William's Favourite.	A medium-sized apple, of pleasant flavour, and beautiful colour: of American origin.
Cornish Aromatic.	A rich, juicy, and aromatic fruit, of medium size; a very good dessert apple.
Margil.	This is by no means a large apple, although one of the most richly flavoured. It makes a good pyramid, and bears regularly. In season from October to January, or later.
Ribston Pippin.	A dessert apple of great value, in flavour second to very few. In some soils it is somewhat liable to canker; to obviate this Messrs James Veitch recommend frequent transplanting, and a warm dry soil. Mr Bunyard says that by working

<i>Variety.</i>	<i>Remarks.</i>
King of the Pippins.	only from vigorous trees, and on the Paradise Stock, canker has been cured.
Allington Pippin.	Undoubtedly to those who prefer a crisp flavour, one of the most satisfactory of all dessert apples. It is handsome, being a deep golden yellow in colour, with a firm crisp and juicy flesh. King of the Pippins is a regular and prolific bearer, and equally suited for kitchen as for table use. Its season is from late October or early November to January.
Cox's Orange Pippin.	The season during which this variety is at its best is from November to February; it is of very good flavour, has a hardy, vigorous constitution, and bears well.
Braddick's Nonpareil.	That there is no better apple grown than this is universally admitted. It is of the most delicious flavour. This variety bears well either as a bush, pyramid; or orchard standard; if possible, however, a warm rich soil should be found for it, and then the fruits reach a high excellence.
	An excellent apple, in season from November to January. It is of medium size and splendid flavour; a russety fruit; it is a prolific variety, grown either as a pyramid or standard.

<i>Variety.</i>	<i>Remarks.</i>
Scarlet Nonpareil.	A handsome, well-flavoured fruit of medium size; does better as a bush or pyramid than as a standard; is an abundant bearer.
Adam's Pearmain.	Indispensable to every collection; of a true conical form, fairly large, brisk flavour, a good keeping variety, thriving particularly well as a pyramid, and in season from December to February.
Brownlee's Russet.	This is a valuable apple, of medium size, and sweet; it bears well either as a pyramid or standard, and is practically indifferent as to the nature of the soil. In use from December to February, or later.
Blenheim Orange.	A large apple, handsome, and suitable for either dessert or kitchen. It is best grown as a bush on the Paradise Stock; root pruning is recommended as an aid to fertility, as Blenheim Orange is usually rather shy of bearing until it reaches a good age.
Baumann's Red Reinette.	A beautiful apple whose skin is highly coloured, finely flavoured, and an abundant bearer. It has received the first-class certificate of the Royal Horticultural Society.
Rosemary Russet.	A distinct looking apple, making an excellent standard. It is of good flavour, and usually bears good crops. In season from December to February.

<i>Variety.</i>	<i>Remarks.</i>
Mannington's Pearmain.	A splendid apple; of medium size and delicious flavour. The tree is not a strong grower, and should be given a good soil. The fruit is in season from November to March; bears well as a pyramid.
Christmas Pearmain.	A pretty apple, somewhat resembling King of the Pippins in shape; of excellent flavour, and ready for use during December. The tree grows and bears well.
Claygate Pearmain.	A very good dessert apple, richly flavoured, medium size. It does well as a bush, and is most valuable as an orchard standard. In season from November to March.
Court Pendu Plat.	This is the "Wise Apple," so called from its flowering so late that the blossoms, as a rule, escape the spring frosts. It is a rather flat fruit, with firm flesh; a good keeper. As an orchard standard or pyramid it thrives and bears well. Keeps in good condition from December to March, or later.
Fearn's Pippin.	An excellent late variety; somewhat small, richly flavoured; it bears remarkably well as a pyramid.
Lord Burghley.	A valuable late apple, one that retains its rich flavour well. It is of medium size, prettily coloured; suitable for pyramid. In use from December to March, or later.
Cockle's Pippin.	An old variety, but yet a valuable late apple, of very good flavour;

<i>Variety.</i>	<i>Remarks.</i>
Sturmer Pippin.	free bearer, making a good orchard tree. January to April. Undoubtedly one of the best late varieties we have. It is of moderate size, and rich flavour, and should be allowed to hang late on the trees. Either as a pyramid or an orchard standard it is valuable.
Duke of Devonshire.	Also a late apple of good quality, and crisp flavour. A good bearer, both in the garden and orchard. In season from February to May.

COOKING VARIETIES

Duchess of Oldenburg.	A fairly large fruit, with crisp and juicy flesh; one of the best early apples, succeeding almost anywhere either as a pyramid or standard. September.
Lord Grosvenor.	A large yellowish-coloured fruit; a valuable early apple, a good grower, and bearing well as an orchard standard, or preferably as a pyramid.
Frogmore Prolific.	The flesh of this large apple is white, tender and juicy. It makes a splendid pyramid, and is an excellent bearer. September and October.
Stirling Castle.	This is a good-sized apple, and the tree bears remarkably well, either as a bush or a pyramid.

<i>Variety.</i>	<i>Remarks.</i>
Ecklinville Seedling.	A sterling kitchen variety, large. It succeeds well in most gardens, being a good grower; and although it may be had in almost any form, perhaps does best as a pyramid.
Grenadier.	A large and handsome fruit, clear yellow in colour; one of the best early culinary apples, cropping constantly, and growing well as either a standard or pyramid. It has received the first-class certificate of the Royal Horticultural Society.
Stone's Apple.	This is a handsome fruit, and large; in colour a pale yellow, slightly tinged with red on the sunny side. This variety is a compact grower, and bears best when grown as a bush or pyramid. It also has received a first-class certificate from the Royal Horticultural Society. It is at its best during October, November and December.
Golden Noble.	A fruit of beautiful appearance, of which a few should be planted. Of somewhat uncertain bearing, and will not keep very well. September to December.
Warner's King.	A very large and handsome apple; forms a good bush or pyramid, and bears well. November.
Small's Admirable.	An apple of medium size and good quality. It may be grown as a standard or pyramid, and bears

<i>Variety.</i>	<i>Remarks.</i>
	satisfactorily in either form. November and December.
Beauty of Kent.	This is suitable either for dessert or kitchen use. A handsome fruit, large, and borne abundantly, especially as a bush or pyramid.
Peasgood's Nonsuch.	One of the very largest, if not the largest apple in cultivation. It figures largely at exhibitions, being particularly handsome. It can hardly be recommended as a profitable apple to grow, for it is not prolific. The roots of young trees usually require to be well pruned. As a cooking variety it is excellent, so far as quality is concerned.
Lane's Prince Albert.	A sterling variety, and a cooking apple that should be in every collection. The fruit is fairly large, and handsome. It forms a most prolific bush, and will also do as a standard. It is in season from November to March.
Blenheim Orange.	This, which also makes an excellent cooking apple, was referred to in the list of dessert varieties.
Sandringham.	A large well coloured fruit, that is abundantly produced by both pyramids and standards. In season from January to March and April.
Wellington (Dumelow's Seedling).	This fruit is fairly large, and one of the very best flavoured cooking apples we have. For baking it is unsurpassed. Bears

<i>Variety.</i>	<i>Remarks.</i>
Mère de Ménage.	well either as an orchard standard on the crab, or as a bush or pyramid on the Paradise. It may be had from December to March.
Royal Late Cooking.	A favourite exhibition variety, by reason of its size and remarkably fine colour. The fruit is somewhat flat in shape, and a dark, reddish crimson in colour. It is best grown as a bush on the Paradise, and then is satisfactory. Thus described by Messrs James Veitch & Sons, Ltd., Chelsea, who offered this apple a few years ago for the first time: A most valuable culinary apple, raised many years ago in the Royal Gardens at Frogmore, where it is highly appreciated for its excellent cooking qualities, and considered to be the best late apple in cultivation. It keeps in perfect condition for from nine to twelve months after being gathered. When better known, this valuable apple will be largely planted. The tree is robust, healthy, and free from canker; it forms a good standard; its stout branches are covered with fruit spurs that are followed by a heavy crop. It may also be grown as a spreading pyramid or bush; as a cordon it bears well when only two or three years old. Award of Merit, Royal Horticultural Society, January 1896.

<i>Variety.</i>	<i>Remarks.</i>
Bramley's Seedling.	An excellent cooking apple. A large fruit, that keeps well. It, like Mère de Ménage, is best grown as a bush on the Paradise Stock. It then fruits splendidly. It may, however, also be grown as a pyramid or standard.
Bismarck.	A large and handsome fruit, finely coloured, but a somewhat over-rated variety. The fruit often becomes badly spotted, and the flesh also becomes soft and woolly. It is a fairly regular and good cropper, and is a favourite exhibition fruit. Will thrive on either the Paradise or Crab.
Striped Beaufin.	A large, handsome apple, that is not unwelcome as a dessert fruit in early spring. It is a good bearer, and in season from December to February.
Newton Wonder.	A variety that is of comparatively recent introduction. It has been awarded a First-Class Certificate by the Royal Horticultural Society, and has proved itself to be a vigorous grower, a good keeping sort, and a free bearer. We have bushes of it that have been a great success. As a standard or pyramid it may also be had. The fruit is large, and is at its best from November to April or May.
Chelmsford Wonder.	This is a handsome, highly coloured fruit, of good quality, and the tree

<i>Variety.</i>	<i>Remarks.</i>
	bears well. It also has received a First-Class Certificate from the Royal Horticultural Society. March to May.
Northern Greening.	A valuable late apple, of moderate size, and one that bears well. Indispensable in late spring.
Rymer.	A large, fine-looking kitchen apple, bearing well as a pyramid. In season from November to March.



APPLE-TETOFSKY

(which, in Cornwall, ripens fully a week before Mr Gladstone)

SELECT LISTS OF APPLES

A SELECTION OF TWENTY-FOUR DESSERT APPLES

July, August and September. Mr Gladstone, Irish Peach, Red Juneating, Worcester Pearmain, Lady Sudeley, Beauty of Bath.

October and November. Ribston Pippin, Margil, King of the Pippins, Cox's Orange Pippin, Allington Pippin.

December and January. Adam's Pearmain, Christmas Pearmain, Braddick's Nonpareil, Scarlet Nonpareil, Fearn's Pippin, Brownlee's Russet, Claygate Pearmain, Rosemary Russet.

February to May. Lord Burleigh, Cockle's Pippin, Sturmer Pippin, Court Pendu Plat, Duke of Devonshire.

A SELECTION OF TWELVE DESSERT APPLES

July, August and September. Mr Gladstone, Worcester Pearmain, Lady Sudeley.

October and November. Ribston Pippin, Margil, King of the Pippins, Cox's Orange Pippin.

December and January. Adam's Pearmain, Christmas Pearmain, Fearn's Pippin.

February onwards. Lord Burleigh, Sturmer Pippin.

SELECT LIST OF TWELVE KITCHEN APPLES

Frogmore Prolific, Ecklinville, Grenadier, Lane's Prince Albert, Bramley's Seedling, Newton Wonder, Beauty of Kent, Wellington, Sandringham, Northern Greening, Stone's Seedling, Blenheim Orange.

SOME RECENT VALUABLE APPLES

Allington Pippin, Royal Late Cooking, Langley Pippin, Early Victoria, Mr Leopold de Rothschild,

Mrs Phillimore, Winter Quarrenden, Rivers' Early Peach.

Allington Pippin and Royal Late Cooking have already been described.

Langley Pippin (Veitch) is the result of a cross between Cox's Orange Pippin and Mr Gladstone. A valuable dessert apple, of medium size, and a pleasant crisp flavour.

Early Victoria (Cross of Wisbech) is said by the raiser to be obtained from Lord Grosvenor and Keswick Codlin, and to be suitable for either dessert or cooking. This variety is remarkably prolific and early, a good grower also.

Mr Leopold de Rothschild was raised by Messrs Veitch (Chelsea) between Cox's Orange Pippin and John Downie Crab. The fruits are very beautiful, and are borne in profusion, of medium size, with a sub-acid flavour.

Mrs Phillimore is an introduction of Mr Bunyard's, who says of it that it is a rich dessert apple for November.

Winter Quarrenden (Pearson) is a splendid new dessert fruit. Of medium size, well coloured, of good flavour, and abundantly produced. In season during November and December.

Rivers' Early Peach is very similar to Irish Peach, but Messrs Rivers, the raisers, describe it as ripening earlier, and not bearing the fruit on the ends of the branches. The tree makes a pretty pyramid, and is an abundant bearer.

PROPAGATION

It is not proposed to enter into elaborate details with reference to the propagation of the apple, for the general cultivator is far more concerned with and interested in its successful treatment when established than before,

for he can now obtain prepared trees so readily and cheaply from nurserymen, who propagate them by the thousand, that it is not at all worth his while to attempt their propagation himself.

Apple trees are propagated either by budding or grafting. The first mentioned process is performed during July and August, and grafting is done in the month of March.

Budding consists in removing a bud from one tree and inserting it under the bark of the stock or branch of another tree. This work is done in the months of July and August, because the bark is during that time more easily raised, and a union more easily effected between the cambium (an inner growing layer) of both bud and stock. The buds inserted are taken from the current year's shoots, choosing shoots that are firm and short-jointed. After having removed a shoot, say nine or ten inches long, and cut the leaves to half their lengths, next proceed to cut out a bud. This is done by inserting a knife below the bud at a distance of about half an inch, and then drawing it upwards behind the bud, emerging again about half an inch above the bud. The cut must, of course, turn inwards—that is to say, towards the centre of the shoot. When removed, the bud therefore will be about an inch long, with the "eye" in the centre, and with a certain amount of wood attached to it behind. This should be removed, and the best way to do it is to insert the point of one's knife just underneath, so as slightly to raise the wood. Then, with the blade of the knife and one's thumb above, it can easily be removed with a slight jerk. Take great care that the root of the bud is not removed also. The stock to be budded should have a T-shaped incision made in the bark. With the ivory handle, which a proper budding knife will have, raise the bark on either side of the longitudinal slit, com-

mencing at the corners just below where it joins the transverse incision. Take great care that the knife handle does not penetrate beneath the inner bark, but press it against the latter, slipping it along. When the bark is sufficiently raised, carefully insert the bud beneath, taking hold of it by the remaining portion of the leaf stalk. It must not be forced down, but introduced as gently as can be, otherwise there will be danger of injuring the vital cambium layer, where the union is effected. Afterwards tie the bud around with matting, to keep it in position and to prevent the entrance of air. Tie both above and below the "eye," leaving this of course free. An excellent indication as to whether or not the bud has taken is afforded by the petiole (leaf stalk). If this, a few weeks afterwards, falls completely away, one may be fairly certain that the bud has taken; if, on the other hand, it withers away, one may be almost equally sure that the operation has not been successful. The buds that have taken will commence to grow in the following spring, and then the stocks must be cut back to within a few inches of where the buds are inserted. Many nurserymen, if they find that the bud has not taken, graft the same stock in the following spring, instead of waiting to bud again in summer.

Grafting consists in so attaching one shoot to another that they unite and grow together. There are many different methods of grafting, but that most usually employed in the grafting of apple trees is tongue or splice grafting. This is done in the month of March, with firm growth of the preceding year. First cut the stock in a sloping direction, and so that the cut may terminate just above a bud if possible. "Great care must be taken that the scions fit the stocks," is the recommendation of one of our large nursery growers of apple trees, and one that should be closely

followed. Therefore choose a graft as nearly as possible of the same size as the stock. Having cut the graft to a suitable length, say nine or ten inches, cut the lower end (that is, the thicker one) exactly as the top of the stock was cut, so that when placed together they will properly fit upon each other. The essential point is, of course, to make sure that the inner bark of the one coincides with the inner bark of the other, as then the cambium layers will also coincide. The graft should be carefully and securely tied on to the stock with raffia, and then covered over with either clay or grafting wax, so as effectually to prevent the entrance of air. It is advisable to place moss over the clay, so that in dry weather this can be watered to prevent the clay from becoming dry. Unless there were a covering of some material capable of holding moisture, it would be impossible to keep the clay in anything like a moist condition. When it is seen that the graft commences to grow freely, the clay may be partly removed so as to allow of the ligatures being loosened. It is wise to tie the graft to a stake attached to the stock when the clay is finally removed, as in rough weather it might possibly be broken off.

The stocks used for budding and grafting the apple upon are the Crab, English and French Paradise, and Doucin Stocks.

The Crab Stock is for standards intended for orchard planting only.

The English and French Paradise and Doucin Stocks are made use of for pyramids, bushes, espaliers, cordons, etc.

The English Paradise is also to be recommended for standards and half standards for garden planting, for it is free growing, and trees grafted upon it come into bearing earlier than those on the Crab.

The surface-rooting stocks, the Paradise and Doucin,

should be budded or grafted close to the ground, and the Crab may be worked six inches above the ground, the graft being allowed to make the stem of the standard tree, or the stock may be grafted at the top of the stem. The former method should not be practised in the case of weak-growing varieties. In any case all side-shoots must, of course, be removed to the desired height of the stem.

The formation of bush and pyramid trees is commenced by cutting off the maiden shoot to within about six inches of where it] was budded or grafted, and continued by training out five shoots as primary branches.

CONCERNING APPLES

BY THE EDITOR

THE apple tree and England, as we have known it, must stand or fall together, and the greatest patriot is he who, having realised this fact, does most to encourage the love and knowledge of the apple in the hearts and minds of the people.

What the orchard has been in the history of our race is shown in the fact that among those unsophisticated, atavistic, racial records, known as schoolboys, the "vice" of "robbing an orchard" is the one most universal, in the presence of which all distinctions and artificial gradations of caste are as nothing. The very name is significant, for it originally denoted not one particular fruit, but fruit in general—any other than the apple being notified by the addition of a suffix as in the Welsh *Aval-mèlynhir*, a lemon, and the early English *Peche-appule*, a peach. Regard, unseen, a solitary unsophisticated Englishman in the act of eating an apple, and you cannot fail to observe that something more than the mere satisfying of appetite is in progress. As he vigorously munches the fragrant and delicious fruit, his mind and his soul are carried back unconsciously to more primitive times, and he becomes almost barbaric. Hence the triviality of the knife-and-fork method of apple eating.

The old Saxon Coronation Benediction suggests how very important a part the apple has played in English national life. "Bless, O Lord, the courage of this

Prince, and prosper the work of his hands; and by Thy blessing may this land be filled with Apples, with the fruit and dew of heaven, from the top of the ancient mountains, from the Apples of the eternal hills, from the fruits of the earth and its fulness."

The amount of English folk-lore and legend connected with the apple is of tremendous extent; and, although most of the ceremonies connected with orchards have been concerned with propitiating the gods, rather than with the worship of beauty, they have yet been little less picturesque and enthusiastic than the more æsthetic outbursts of the Japanese. It is to be feared, however, that, in these days of materialism and doubt, few are the places when, on the eve of the Epiphany, the farmer and his workmen, "with a large pitcher of cider, go to the orchard, and there encircling one of the best bearing trees drink the following toast three several times:—

"Here's to thee, old apple-tree,
Whence thou mayst bud, and whence thou mayst blow!
And whence thou mayst bear apples enow!
Hats full! caps full!
Bushel—bushel—sacks full,
And my pockets full too! Huzza!"

Brand quotes another quaint custom as sometimes followed in Devonshire. "On the eve of Twelfth Day, it is the custom to go after supper into the orchard, with a large milk-pan full of cider, having roasted apples pressed into it. Out of this each person in company takes a clayen cup, full of liquor, and standing under each of the more fruitful apple-trees, passing by those that are not good bearers, he addresses it in the following words:—

"Health to thee, good apple-tree,
Well to bear pocket-fulls, hat-fulls,
Peck-fulls, bushel bag-fulls.'

And then drinking up part of the contents, he throws the rest, with the fragments of the roasted apples, at the tree. At each cup the company set up a shout."

Not in England only has the apple held such an important place in the national idea, for the folk-lore of Scandinavia and Germany is full of apple trees and golden apples; whilst the Latin goddess Pomona was the ruler over all fruit trees. Indeed, in Roman times the cultivation of the apple reached a high pitch, and numerous varieties—named, in the same way as at present, after noted men—such as the Claudian, Appian, and Tiberian, were known and were increased by the process of grafting.

But long before the times of Rome, and even of Athens, the apple was cultivated by the Lake dwellers of Switzerland in the Age of Stone. Carbonised specimens of two varieties of apples, cut lengthwise and dried, have been found in the palafittes of the lakes of Neufchâtel, Lombardy, and elsewhere.

The earliest inhabitants of Britain held the apple tree in high honour and reverence, and it must have been grown in orchards at a very early date, for the old Roman name of Glastonbury, Avalloun, was but a modification of Ynys Avalla, Celtic for Apple Orchard.

What varieties of apple were grown by the early Britons is not known, but it is certain that new kinds were introduced into England both by Romans and Normans, though in former times the Crab-apple was much more valued than it is at present. Ale and roasted Crab-apples was a popular combination long after choice varieties were numerous and common. The Pearmain was grown in the twelfth century and was used for cider making, and the Costard—whence the name of costermonger is derived—was another apple of that period. Among other apples cultivated in the middle ages were "Bitter Swetes" (Chaucer), Pippins ("You

shall see mine orchard, where in an harbour we will eat last year's pippins of my own graffing,"—Shakspeare), "Pomewaters," "Apple Johns" ("a delicate fine fruit, well rellished when it beginneth to be fit to be eaten, and endureth good longer than any other Apple,"—Parkinson), and "Leather-coats" (Shakspeare). The Redstreak, or Scudamore crab, was introduced in the early part of the seventeenth century, and is mentioned by Evelyn, as also is the Genneting, which had probably been cultivated long previously.

THE COOKERY OF APPLES

BY THE EDITOR

ROASTED APPLES

IN that wise and witty volume, "The Original" of Thomas Walker, the author quotes the remark of a "foreigner" that "we have no ripe fruit in England but roasted apples," and he follows this quotation by a suggestion for a "greatly improved mode (of ripening after this fashion), which was brought from Paris, and which, when well managed, makes rather a rich dish of rather an insipid one. Select the largest apples; scoop out the core, without cutting quite through; fill the hollow with butter and fine soft sugar; let them roast in a slow oven, and serve them up with the syrup."

Whilst not agreeing that we have no other fruit worthy of being called ripe, one becomes filled with strange longings and cognisant of vigorous palatal tapings as the vision of properly roasted apples comes before the eyes of our consciousness. That is an admirable method which Walker suggests, for not only is the fruit thoroughly cooked thereby, but that source of annoyance, known as the core, which so mars the joy of most eaters of roasted apples, is removed and replaced by succulence and sweet savour. Do not follow the Portuguese, who place water in the dish, nor copy those sacrilegious folk who would add marmalade or lemon juice to the cooked apple; for there are three things only with which it will blend without loss of character.

Butter to aid in the cooking, and fine castor sugar and cream on the plate, are the only adjuncts to roasted apples which must be thought of, though the addition of a very little clove or cinnamon (as Gouffé suggests) previous to cooking is sometimes pleasant.

STEWED APPLES

Into the world of drab are we borne as we descend from these aromatic heights to consider the uninspiring dish commonly known as stewed apples. This, as usually prepared, is but a purée, and is for children and the unimaginative "healthy eater." But stewed apples may be a very different dish, and in its preparation we should introduce what of skill and science we have at command. This is one of many possible ways. Place in a stewpan a quart of water and half a pound of loaf sugar, together with a few cloves and the rind and juice of a lemon or orange. Core, but do not peel, eight large cooking apples, and place them also in the pan. Let the contents simmer gently until the fruit is cooked but not broken, when it should be very carefully removed to a dish, the juice being reduced and strained, and subsequently poured over the apples.

APPLES WITH TAPIOCA

A very pleasant dish is made by buttering a dish and placing in it eight large apples which have been cored and pared; pouring over the apples a little sugar and half a pint of tapioca which has been soaking for an hour in a minimum of warm water. The whole requires to be baked for about an hour.

APPLES WITH RICE

Rice may be substituted for tapioca in the above recipe, or the following method of combining rice with apples suggested in the admirable American Century Cook Book may be employed. Boil quarter of a pint of rice with a saltspoonful of salt in milk until tender; sweeten it to taste; drain it if the milk be not all absorbed; press it into a basin; smooth it over the top; when it has cooled enough to hold the form, turn it on to a flat dish. This will be a socle, and should be about one and a half to two inches high. Pare and core as many apples as will stand on the top of the socle; boil them slowly in sugar and water until tender; remove them before they lose shape. Boil the sugar and water down to a thick syrup. Arrange the apples on the top of the rice, and pour over them a little of the thickened syrup. The Century Cook Book advises that the centre of each apple be then filled with jam, a candied cherry being placed on each, and a pointed piece of angelica between each apple. Cream, however, may wisely replace jam, cherry and angelica.

APPLE DUMPLINGS

afford one of the most generally popular dishes of which our national fruit is the chief constituent. Pare and core as many large apples as is the number of dumplings required. Fill each centre with a clove, a little sugar and a piece of butter. Each apple must then be covered with well-made suet-paste tied in a well-floured cloth, and boiled for thirty to forty minutes. Instead of boiling them, a pleasant variety is gained by the baking of dumplings. For this purpose, they are made in a similar way, but the paste should be thinner and

the apples should be placed on it, the edges being merely brought up to the top of each apple and pinched so as to flute them. The dumplings must not be wrapped in a cloth but placed on a buttered tin. They should be baked in a moderate oven for about three-quarters of an hour.

For the making of

APPLE CHARLOTTE

there are numerous prescriptions, many being excellent. The following, modified from Mrs Roundell's valuable "Practical Cookery Book," is as good as any. Choose apples which are known to bake well. Pare them, core them and quarter them. Put the apple quarters with the cores, peels and pips into half a pint of water (or just enough to cover them), and squeeze in the juice of a lemon. Let the apple quarters soak in this for half an hour, then taking them out and drying them. Mince the apples, mince the peel of a lemon, and put all into a stew-pan with just enough syrup to cover. Simmer the apples very gently, and take care that they do not burn. When they are quite soft pass them through the sieve, and stir in a dessertspoonful of kirsch or a couple of bruised cloves. Put all back in the pan and simmer, stirring continually till the marmalade is stiff. Leave it to rest whilst you prepare the mould. Butter the mould with a brush. Cut some thin strips of white bread two inches wide and as long as the mould is high. If the mould tapers, narrow the strips of bread so that they may fit. Cut more slices of bread to fit the top of the mould neatly. Melt some butter in a soup-plate over hot water, and dip the slices of bread into it, dusting them all over with sugar, and putting plenty of sugar on the edges. Fit the strips of sugared bread close to each other in the mould so as to line it com-

pletely. Put in the marmalade, covering the bottom neatly with slices of bread. Put a plate with a weight on the mould to keep the marmalade in place. Bake till the bread is crisp and a pale brown. It will probably take three-quarters of an hour in a moderate oven. Be very careful in turning out the apple charlotte. Hand castor sugar, and cream if liked.

Another very excellent recipe in the "Century Cook Book" is for a dish called

BROWN BETTY

In a quart pudding-dish arrange alternate layers of sliced apples and bread crumbs; season each layer with bits of butter, a little sugar, and a pinch each of ground cinnamon, cloves and allspice. When the dish is full, pour over it a quarter of a pint each of molasses and water mixed. Cover the top with crumbs, place the dish in a pan containing hot water, and bake for three-quarters of an hour, or until the apples are soft. Serve with cream.

Nothing is simpler than the frying of

APPLE FRITTERS

yet how seldom are they satisfactorily accomplished. A deep frying kettle containing at least three pounds of heated ("boiling") oil is essential. Pare and core six large apples, slicing them into circles about half an inch thick. Place them in a basin with two ounces of fine sugar and desirably with a sherry-glassful of brandy. Shake well together, and allow them to stand for at least an hour. Then drain the slices on a cloth, and dip each piece in a batter made by pouring a teacupful

of water into six ounces of finely sifted flour, adding a pinch of salt, three tablespoonfuls of olive oil and the yolks of three eggs, stirring all well together, and finally adding the well-beaten whites of the three eggs. Each slice of apple is then to be placed in the heated oil and fried till yellow, crisp and dry, when it is to be taken out, drained on a cloth, placed on a hot dish and sprinkled with sugar.

To make

APPLE JAM

allow three-quarters of a pound of sugar and the juice and grated rind of one lemon to each pound of apples—pared, cored, and sliced; adding the sugar gradually and being careful to avoid burning.

To make

APPLE JELLY

allow a pint of water to each pound of *whole* apples, and simmer until softened. Strain the juice—using no pressure—until clear. To each pint of juice add a pound of sugar and the juice of three lemons, and boil until it stiffens, which will take about half an hour.

Many of the smaller apples afford pleasant pickles, the principles to be observed being given as clearly as need be in Mrs Glasse's recipes:—

“TO PICKLE GOLDEN PIPPINS

“Take the finest pippins you can get, free from spots and bruises, put them into a preserving pan of cold spring water, and set them on a charcoal fire. Keep them turning with a wooden spoon, till they will

peel ; do not let them boil. When they are soft enough, peel them, and put them into the water again, with a quarter of a pint of the best vinegar, and a quarter of an ounce of alum ; cover them very close with a pewter dish, and set them on the charcoal fire again, a slow fire, not to boil. Let them stand, turning them now and then, till they look green ; then take them out, and lay them on a cloth to cool. Then take as much vinegar as will fill your jars : to every gallon put a quarter of a pint of mustard seeds whole, two or three heads of garlick, a good deal of ginger sliced, half an ounce of cloves, mace, and nutmeg ; mix your pickle well together, and pour over your pippins. Cover them close, and keep them for use."

The alum may wisely be omitted from the recipe.

"TO PICKLE CODLINS

"When you have greened them as you do your pippins, and they are quite cold, with a small scoop very carefully take off the eye as whole as you can, scoop out the core, put in a clove of garlick, fill it up with mustard seed, lay on the eye again, and put them in your glasses, with the eye uppermost. Put the same pickle as you do the pippins, and tie them down close."

APPLE SALAD

Miss Yates, in her very suggestive little book, "The Profession of Cookery," gives a recipe for a tasty apple salad. Keswicks are the best for the purpose, on account of their sharp juiciness and fine green skins. "Core the apples, but leave the skins on. Slice them on to a shallow dish, dust them with cayenne pepper,

and sprinkle among them a few finely minced shallots. Place a few split capsicums and tiny pickled gherkins about the edge, strain a little lemon juice, and mix it with an equal quantity of salad oil, and a pinch each of salt and powdered sugar. Pour over the apples, and serve before they have time to change colour."

To the ordinary English palate, the thoughts of

APPLE SOUP

will bring no excessive anticipatory watering; yet it is a fairly popular soup in Germany. It is there made by boiling together twelve lumps of sugar, eight medium-sized apples—peeled and cored—two ounces of bread-crumbs, the juice of two lemons, half a teaspoonful of cinnamon and three pints of water. Various flavouring herbs may be added if thought desirable.

EVAPORATION OF APPLES

Although not strictly a culinary process, it would be inexcusable to dismiss our subject without some remark on the valuable method of preserving surplus fruit known as drying or evaporation. Hawthornden, Ecklinville, Dumelow's Seedling and the other good cooking varieties especially lend themselves to the process, but no good apple is unsuitable.

Mr Trotter of Ledbury, who has done much to popularise this method of preservation, describes his preparation of the apples as follows:—

"They are first pared, cored, and sliced by a very simple and ingenious machine which will either pare, core, and slice the apples, or, by removing a knife, will only pare them as for whole apples or the so-called

Normandy Pippins. After the apples have been pared, cored, and sliced they are placed in a tub of perfectly clean water, containing a small quantity of salt, which prevents oxidation and discoloration. They are then cut once vertically, and all bruises, specks, and parings trimmed away to produce the well-known apple rings of commerce. They are then placed thinly on a tray and entered at the lower end of the *upper* flue. Sometimes a little sulphur may be sprinkled on the furnace with great advantage for the purpose of bleaching the rings. The first tray remains in the position just mentioned until the second tray is ready—which will be in four or five minutes—to be placed under the first tray; the third tray is then filled in the usual manner and placed under the second tray, and when the fourth tray is ready the first three trays are pushed forward in the flue, and the fourth tray takes the place of No. 1, and so on until the top flue is full.

“On the arrival of the first tray at the upper end of the flue the contents are examined, and those which are sufficiently dried are removed, and the remainder turned over and returned down the lower and cooler flue. In many cases one tray will hold the whole of the contents (which are nearly dried) of two or three trays, the empty ones being taken away to be again filled with fresh fruit.

“The degree of heat used for drying apples is from 175° to 240° Fahrenheit; and the time occupied varies from two to four hours, according to the variety of the apple, but from two to two and a half hours is the usual time. Whole apples require a much longer time, eight to ten hours, according to size and variety.”

The various “Invicta” Evaporators of Messrs Lumley are about the best and simplest for use, both for domestic and wholesale purposes.

The “Invicta” Evaporator consists of

1. A *stove or furnace* which will consume any kind of fuel—coal, coke, wood, &c.—to create the required degree of heat, and it is so simply constructed that only ordinary intelligence is required to manipulate it successfully. From this furnace runs

2. An *iron pipe*, through which the smoke produced ascends, and which may be lengthened or shortened as varying conditions demand. It may be led into the



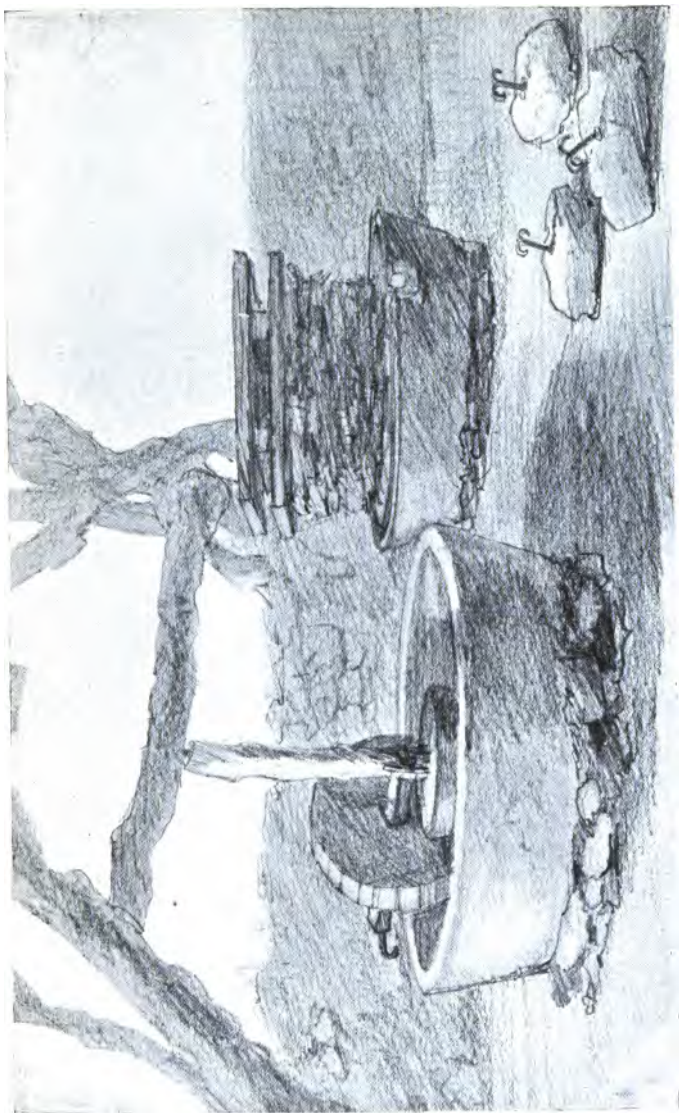
LUMLEY'S "INVICTA" EVAPORATOR

open air or may terminate in a chimney, as the case necessitates. Above the stove is

3. A *chamber* in which the various currents of air, heated more or less by having passed alongside the furnace from the bottom to the top, are so mixed as to cause uniformity in the temperature before the air ascends into

4. *The inclined flues of the trunk.* This is constructed of wood, and rests on the stove at a slightly inclined angle. It is divided into two flues, one ascending, the other descending. The flues contain

5. *The trays*, on which the material to be dried is



PRIMITIVE CIDER MILL AND PRESS

thinly spread. These trays are of wood with a galvanised wire-cloth bottom, and being light they can be easily handled. Two, three, or four of the trays, according to the size of the machine and the article to be dried, are put one on top of another inside the flue, thus forming a group of trays which travel together through the flue or drying chamber.

CONCERNING CIDER

BY THE EDITOR

MANY people would be as ashamed to acknowledge their preference of cider before claret as they would be to express their failure to appreciate decomposed game, caviare, George Meredith, or other objects which are supposed to be but with difficulty comprehended by "the general." But, in truth, "although there is no Liquor, Drink, nor Diet alike pleasant to all . . . , yet is there not any drink known to us so generally palatable as Cider; for you may make it sute almost with any humourous Drinker: It may be made luscious; by addition of a good quantity of sweet Apples in the first operation; pleasant, being made with Pippins or Gennet-royles only; racy, poignant, oyly, spicy, with the Redstreak, and several other sorts of Fruits, even as the operator pleases. And it satisfies thirst, if not too stale, more than any other usual Drink whatsoever." The great objection which most people have to the use of cider at their tables is that at which Mrs Glasse scoffed so amusingly in her preface to "The Art of Cookery"—"but then it would not be French." For between the well-made ciders of England and the great majority of imported wines, the unprejudiced drinker will rarely have much difficulty in choosing.

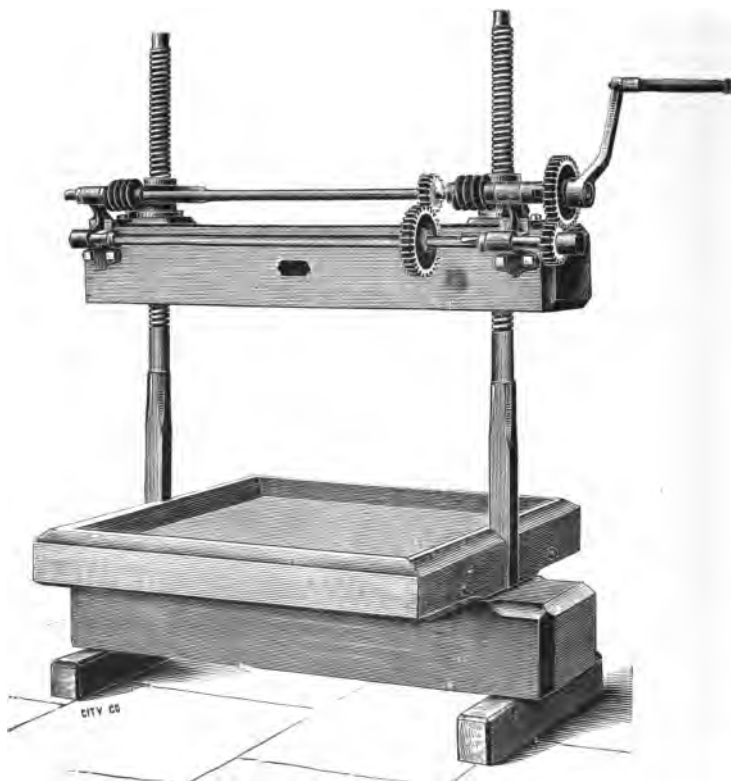
The following figures, given by Mr Alfred H. Allen, Public Analyst for the West Riding, indicate broadly the proportions of alcohol (per cent. by volume) contained in various beverages, each kind of which is, of course, liable to a certain range of strength:—

CIDER.	Alcohol. Per cent.
French, minimum of Pomological Society	4
„ average of sweet samples	3·8 to 4·1
„ „ dry „	5·4
„ Paris municipal requirement average	5 to 6
„ „ „ minimum	3
English—Bath and W. of England minimum	4
„ Norfolk, bottled	6 to 9
„ Devonshire, bottled (extra dry)	6·7
„ Herefordshire, bottled	6·6
American, dry	6·4
„ sweet	2·5 to 4
BEER.	
Ordinary draught	4·5
Burton Pale Ale	6·3
Guinness's XX Stout	6·6
Pilsen Lager	3·5
American Lager	2·8
WINE	
Bordeaux (vin ordinaire)	7 to 9
Beaune	13
Rüdesheimer	10
Champagne	11 to 13

The proportion of proof spirit can be found by multiplying the figure for alcohol by seven and dividing the product by four, or, more accurately, by multiplying by 1.7525.

The disappearance of cider from every-day England is largely a Victorian phenomenon, and, with the revival of taste in literature and domestic architecture, cider is again showing signs of winning its way back into popular favour. "I do only wish—upon the prospect and meditation of the universal benefit—that every person whatever, worth ten pounds per annum, within Her Majesty's dominions, were by some indispensable statute, obliged to plant his hedge-rows with the best and most useful kinds of fruit trees. Undoubtedly, if this course were taken effectually, a very considerable part both of

the meat and drink, which is spent to our prejudice, might be saved by the country people, even out of the hedges and mounds, which would afford them not only



IMPROVED QUADRUPLE GEAR HAND PRESS (WORKMAN AND SONS)

(Awarded the First Prize at the R.A.S.E. Trials)

the pleasure and profit of their delicious fruit, but such abundance of cyder and perry, as should suffice them

DRINK OF CONCERNING CIDER FOR

to drink of one of the most wholesome and excellent beverages in the world."

Much in the same strain wrote Gerarde: "Forward in the name of God, graff, set, plant, and nourish up trees in every corner of your land. The labour is small, the cost is nothing, the commodity is great. Yourselves shall have plenty, the poor shall have somewhat in the time of want to relieve their necessity, and God shall reward your good minds and diligence."

Many writers and practical reformers took a similar view as to the benefits to be obtained from the more extensive culture of apples, and from improvement in the manufacture of the "noble Drink" which apples yield.

Evelyn tells us that Herefordshire in the middle of the seventeenth century "had become in a manner but one entire orchard," as much as five million gallons of cider being produced within a circle of twenty miles diameter; and Dr Beale, a Herefordshire man of the seventeenth century, said: "Few cottagers, yea, very few of our wealthiest yeomen, do taste any other drink in the family, except at some special festivals, twice or thrice in the year, and that for variety rather than with choice."

There are probably few, if any, parts of these islands where good cider apples may not be grown, and good cider made. For, although Gloucestershire, Herefordshire, Devonshire and neighbouring counties have been lately most associated with the cider industry, Norfolk, Surrey, Buckinghamshire, Dorsetshire, Essex and many parts of Ireland have all been celebrated for their cider in times past. That Sussex also contained its ciderists is shown by a verse quoted by Mr Radcliffe Cooke in his book on "Cider and Perry" as having been written in 1803 on the fly-leaf of a copy of Phillips' poem "Cyder":

THE BOOK OF THE APPLE

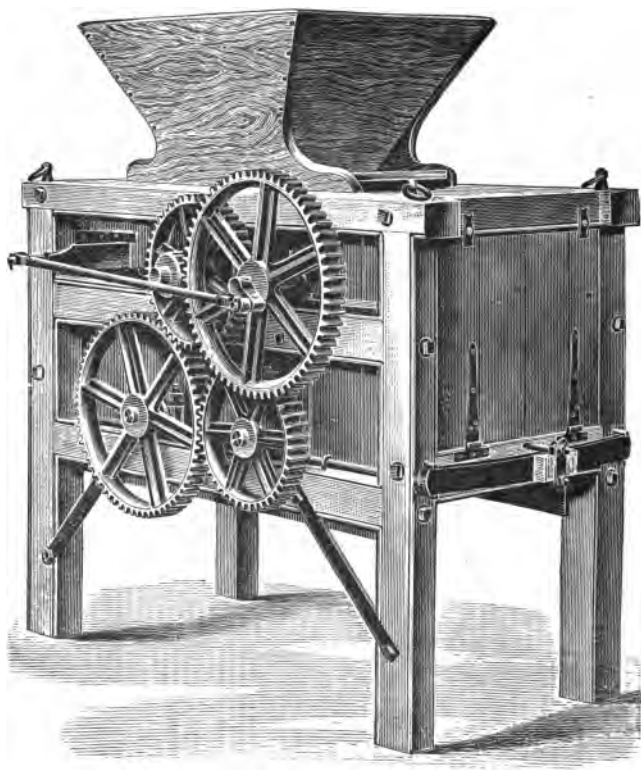
“ Some people give perry and call it champagne,
Not so gives of Petworth the rector;
’Tis cider he tells us his vessels contain,
But on tasting it proves to be Nectar.”

Snobbery, which has abolished “supper” and many another good thing, is responsible for a good deal of the neglect which has fallen on cider, but carelessness and ignorance in its extraction and preparation are also responsible for much. There are times and seasons for gathering the fruits, and there is “a true and right method of Grinding, Pressing, or Extracting their Juices, and fermenting, preparing and preserving the same when extracted,” and these times and this method are very different from the times selected and methods adopted by the bulk of small cider makers to-day. It is largely owing to the thin, sour, musty, bodiless liquid which so often goes by the name of cider, that, even in the agricultural districts of the best cider counties, its use as a popular beverage has almost atrophied. Not for terrible stuff with such vinegar aspect would I plead, but for that pale amber liquid, limpid, bright, and possessed of the most wonderful fragrance and flavour, “as if the fruit had been packed in flowers and spices,” which alone deserves the name of cider. Good cider should be tart and smart, yet neither sour nor harsh; and fruity and smooth, yet not sweet or sickly. If he but exercise care and common sense, anyone may, with little trouble, manufacture such excellent wine—for cider is as much a wine as are the wines of Bordeaux or the Rhine. At present most of the best cider is made by commercial firms such as Messrs Bulmer, of Hereford, Mr Radcliffe Cooke, of Hellens, and a few others, to whom Englishmen owe much for their efforts to restore character to one of England’s greatest achievements.

Strolling one day along one of the many shady lanes in that most beautiful of all the beautiful districts

of Cornwall—the district of St Keverne, Porthoustock, and Coverack—I arrived by chance at a little pig-occupied farmyard, in which was a tree of laurel fully sixteen yards across. It was not, however, the tree itself which arrested my attention, but a very primitive machine connected therewith, a machine which seemed to suggest the Age of Stone. Resting with one end on the fork of the laurel tree, and with the other on an adjacent wall, was a long, irregular beam, in the centre of which was a sort of nut, in which fitted loosely an iron pivot attached to an upright pole. At the lower end of this upright was another pivot, which was able to be revolved in a hole in a solid cylinder of granite, about eighteen inches in diameter. This cylinder occupied the centre of a roughly circular trough, also of granite, about two yards across and about two feet in depth, the sides of which sloped inwards. At about six inches from the lower end of the upright post was attached a cross-bar, which formed the axle of a great dome-shaped granite wheel, resting with its furrowed edge on the floor of the basin. On holding the outer end of this axle, and walking in the circular path which its extremity mapped out, I was able with a little effort to cause the upright pole to revolve on its axis and the great wheel to travel around the trough, then half-full of offensively odorous water, loaded with decomposing leaves and other organic materials. Of course this was a cider-mill, and by similar, though not usually quite so primitive, appliances apples are still ground by the bulk of farmers who make cider to-day. Close by was a cider-press in keeping with the mill. This was simply a thick disc of granite about nine inches thick and five feet in diameter, with, near its edge, a two-inch ditch terminating at one point in a sort of spout. On this base the cheese of bruised apples would be placed, pressure being applied by means of some great stone

weights, which were lying alongside, evidently constructed for attachment to the end of a pole or flail.



STEAM POWER CIDER MILL (WORKMAN AND SONS)

(Capacity: 100 Bushels Apples per hour)

The apple juice, strained through straw, would pass into the stony furrow and thence by the spout into tubs placed to receive it. I think one need not plead guilty

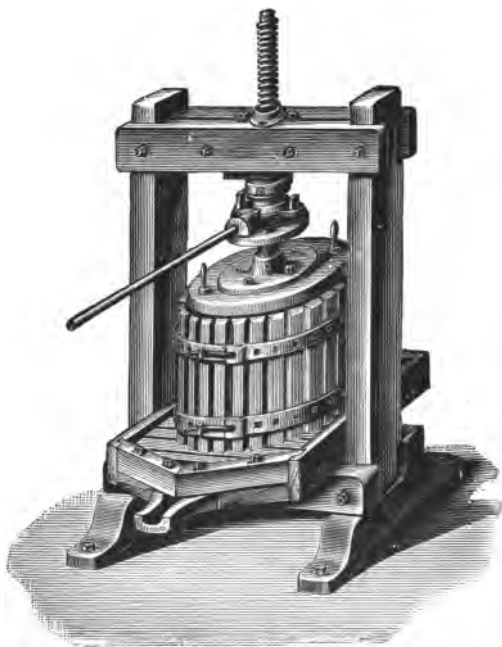


CIDER-MUST FILTER (Maignen's Patent)

to over-fastidiousness if he acknowledged that a vintage prepared amidst such surroundings would ill please his gorge. The whole arrangement, though full of interest, was unappetising ; for cleanliness, that first essential of cider making, was obviously unheard of.

Excellent cider has been, and is still being, made by stone mills and presses no more complicated than the one I have described, and no doubt by even more primitive means. Worlidge, in the middle of the seventeenth century, said that it had "been the usage or custome in most places of England, where but small quantities of this Liquor hath been made, for the operators to beat their Fruit in a Trough of Wood or Stone, with Beaters like unto Wooden Pestles, with long handles. By which means three or four Servants or Labourers might in a day's time beat twenty or thirty Bushels of Apples : some part thereof into a Jelly, being often under the Beaters, whilst other part of the Fruit by its slipperiness escapes the Beaters ; much of it also by dashing being wasted : yet by this means are made very great quantities of Cider in several places. But when the Fruit increased, that this way became too tedious for the Ciderist, the Horse-Mill was and is still much in use." Worlidge's description of the horse-mill tallies with the description of the old mill I have already given. Later he mentions that "some have taken the pains to Grate Apples on a Grater made of perforated Latten, such that House-wives use to Grate Bread on ; Others, to beat them on a Table with Mauls : but these ways are to be rejected as idle and useless, where you have any considerable plenty of Fruit. To remedy the inconveniencies, trouble and expences in those several ways that have been hitherto used, you may erect a Mill, the Ichnography whereof, you have in the following Figure." He then gives figures of the parts of a cider mill not very unlike, in essential part, the modern scientific hand-mill.

This is provided with a wooden hopper for the reception of the apples. These, on the handle being turned, are torn by being passed between toothed rollers of enamelled iron, and then further crushed by



"NIAGARA" CIDER PRESS (BARNETT AND FOSTER)
With Differential Lever Action and no Centre Screw

being passed between smooth rollers of stone, hardwood, or enamelled iron. Instead of the old Flail-Press, some form of Screw-Press is now usually employed, and indeed Worlidge advised that no other kind was so generally useful—though little used—in

his day. Various mechanisms have been devised for reducing the necessary labour connected with the Screw-Press, all of which may be studied at the works of such firms as Messrs Barnett & Foster, of Eagle Wharf Road, London, Messrs Lumley, of America Square, London, and Messrs Workman, of Slimbridge. Whilst it is desirable that all the machinery should be as easy as may be in working, it is yet advisable to employ as few complications as possible, since every part omitted is one less part to get out of order, and so cause trouble and disappointment.

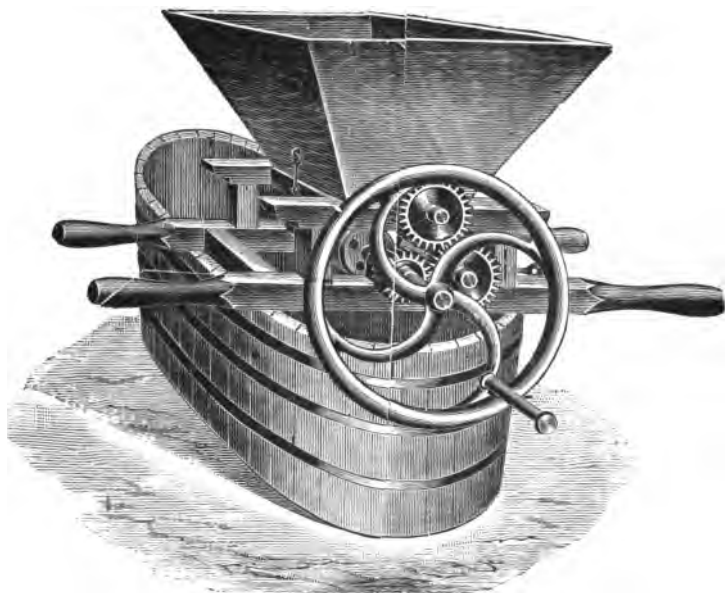
Opinions are somewhat divided as to whether or not the very best cider can be made from any single variety of apple. Certain kinds of apple are markedly rich in sugar, and consequently yield a cider strong in alcohol; others are rich in acids and yield a high-flavoured wine, whilst others are rich in extractives and yield a rich, well-bodied cider. Whether, however, any one variety of fruit contains these ingredients in the best possible proportions, so that the addition of any other variety affords no gain to the product, may well be doubted.

The following are a few of the most desirable cider apples: Foxwhelp (which is advantageously blended with a bitter-sweet variety), Cherry Pearmain, Strawberry Norman (an excellent bitter-sweet), Redstreak (which should be blended with bitter-sweets), Royal Wilding (a somewhat flavourless but useful bitter-sweet), Kingston Black (a splendid cider apple), and Hangdown.

In apples intended for the making of cider it is important that all possible starch shall have been converted or ripened into sugar, as it is from sugar alone that the alcohol is obtained in the process of fermentation. This ripening process is able partly to be effected after the apples have been picked or shaken from the trees, but during this period of storing they should not be piled in great heaps, as is usually done, but should be thinly

piled on boards or straw in a place where abundant air may reach them, and if possible where also they may obtain the beneficent smile of the sun.

As cider should consist of fermented apple juice alone, and as the product of the cider-press naturally contains a good deal of cellular tissue and other solid matter in



SIMPLE APPLE GRATER AND FRUIT MILL (BARNETT AND FOSTER)

suspension, it is very important that the crude juice be carefully strained through a fine meshed filter before the process of fermentation has commenced. A charcoal filter is especially useful for this purpose, and the following description of an easily-made one, borrowed from Trowbridge's "Cider Maker's Handbook," may be found of use. Remove one head of an ordinary cider or whisky

barrel, and make a false bottom of it, thus: cut away its edge until it will fit inside the barrel two inches from the other head; then nail some strips of tasteless hard wood, a quarter of an inch square, on one side, a quarter of an inch apart, until that side is covered; then between the strips bore quarter-inch holes through the head, an inch apart. Support this false bottom on blocks two inches above the other head, which now becomes the bottom. Through one stave, flush with the inside of the bottom, bore a hole and insert a tasteless wood faucet. Finally make a circular grating of inch by half-inch strips, placed an inch apart, and held by two or three of the same strips nailed crosswise. It should have a diameter a little less than the open head of the barrel, to go out and in freely. To charge the filter, place on the false bottom a stout piece of cloth of rather close texture. It must be large enough to turn up a couple of inches all round. On this place three inches of hardwood charcoal, thoroughly burned and pulverized as finely as bird-shot. Over this place another rather coarser cloth, and on this about four inches of sound, clean, well-washed rye or wheat straw. Press down on this the grating and slip it under some blocks nailed inside the barrel, to hold it down firmly upon the straw. Next wash the filter. Open the faucet and pour in water—hot water, if you have it—and keep water flowing through it until it issues entirely tasteless. When that occurs discontinue the water supply, but leave the faucet still open to drain. When the flow ceases your filter is ready for juice. The first flow, after turning in the juice, will be the water remaining. Put that in the vinegar barrel or throw it away.

Many other forms of simple and effective filters may be devised, but, whatever kind is used, it is essential that the filtrate shall be bright and perfectly clear.

The expressed apple juice, having been freed by filtra-

tion from undissolved solids, is next to be subjected to the process of fermentation, that is the conversion of its sugar into alcohol. For this purpose, it should be exposed to the air in large open vats, or in casks with the bung-hole left open. All the apple juice that is to be fermented in one vat or cask should be placed in it within twelve hours from the time of placing any therein.



“RAPID” STARTING SYPHON (BARNETT AND FOSTER)

The specific gravity should be taken daily by means of a brewer's hydrometer, about six-sevenths of the total solids consisting of sugar. Approximately, the sugar gives about half its weight of alcohol, and it has been found that each decrease of one-hundredth in the specific gravity of the fluid during fermentation corresponds to the conversion of two per cent. of sugar

into one per cent. of alcohol. The scum which rises to the surface of the liquid must be skimmed off two or three times daily, and, as soon as this frothy crust ceases to rise, the cider still in process of active fermentation is to be drawn off with great care by means of a rubber syphon or pump and hose into perfectly clean casks. It is well to rinse out the casks with water of about the same temperature as that of the cider which is to fill them, as a sudden drop of heat is very injurious. The casks of cider should be kept at a steady temperature of about fifty degrees Fahrenheit. If the open vat system of "purging" is unavailable, then the cider is to be placed in casks with the bung-holes left open, the cask being kept full to the brim by frequent additions of clear old cider. The scum in this case overflows at the bung-holes until the purging process is complete. Subsequently the cork is to be inserted, a bent glass tube being passed through its centre, ending outwardly in a basin of water. The excess of carbonic acid gas is thus enabled to escape. As soon as the conversion of sugar into alcohol is almost complete, the cider should be carefully filtered at a low temperature by means of a *Filtre Rapide* or other suitable strainer (which must not consist of charcoal, sand or clay), and stored in clean air-tight casks in a cool place, being previously pasteurised if the process be thought desirable or worth while. The cider must then be left for a time in order to ripen, that is to develop bouquet and vinosity. If intended for bottling, that process may be performed in the following spring, or preferably in the following autumn. All antiseptics, preservatives and artificial flavouring agents should be avoided as suggestions of the devil. Scrupulous cleanliness of fruit, filters, presses, mills, vats and casks should make the two first-named possible additions unnecessary, and careful selection of fruit should make the idea of artificial flavouring an obvious absurdity.

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